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Emissions from Heavy-Duty Engines Using the 1984 Transient Tests Procedure. Volume II: Diesel

Southwest Research Inst.
San Antonio, TX

Prepared for

Environmental Protection Agency
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EMISSIONS FROM HEAVY-DUTY ENGINES USING THE 1984 TRANSIENT TEST PROCEDURE VOLUME II-DIESEL

by

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This report describes the portion of the heavy-duty, diesel engine, baseline emissions program that was conducted at Southwest Research Institute. Initially, a facility was developed which was capable of complying with the requirements in the 1984 dynamometer transient test procedure. Nineteen diesel engines were then tested over the transient and the 13-mode emissions tests procedures. Two of these engines were retested for correlation purposes. Emissions measured were hydrocarbons, carbon monoxide, oxides of nitrogen, and particulate. Additional evaluations included: alternate fuels, alternate transient cycles, and particulate correlation tests.

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ABSTRACT

This report describes the portion of the heavy-duty, diesel engine, baseline emissions program that was conducted at Southwest Research Institute. Initially, a facility was developed which was capable of complying with the requirements in the 1984 dynamometer transient test procedure. Nineteen diesel engines were then tested over the transient and the 13-mode emissions tests procedures. Two of these engines were retested for correlation purposes. Emissions measured were hydrocarbons, carbon monoxide, oxides of nitrogen, and particulate. Additional evaluations included: alternate fuels, alternate transient cycles, and particulate correlation tests.

FOREWORD

This project was inititated by the Standards Development and Support Branch, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. The effort on which this report is based was performed by the Department of Emissions Research, Southwest Research Institute, 6220 Culebra Road, San Antonio, Texas 78284. This project, authorized by Contract 68-03-2603, began on September 26, 1977 and was completed on July 1, 1981.

The SwRI Project Leader was Mr. Sherrill Martin. Mr. Charles Urban assisted in supervising a portion of the baseline emissions evaluations with the gasoline engine. Mr. Terry Ullman and Mr. Karl Springer were involved in the design and operational details of the diesel emissions measurement system. Mr. Springer was the Project Manager and was primarily responsible for the technical and fiscal negotiation of the initial project and subsequent modifications.

The initial Project Officer was Mr. Richard Nash of the Standards Development and Support Branch, Environmental Protection Agency. Subsequent Project Officers were Mr. Richard Burgeson, Mr. Timothy Cox, Mr. Eugene Danielson and Mr. John McGuckin. This project was identified within SwRI as No. 11-5044-001.

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I. SUMMARY

In order to provide heavy-duty diesel baseline emission data for emission standards development, a transient test facility for heavy-duty diesel engines was developed. It complies with all requirements for the 1986 HD Diesel Federal Test Procedures.[1]* Engine control was achieved using two independent control loops. The dynamometer controlled the engine speed and a driveshaft torquemeter/throttle servo system was used to follow the required torque schedule. To fulfill the primary objective of the project, transient and steady-state tests were run on all engines. A system was developed to control temperature and humidity of the engine inlet air during transient tests.

The constant volume sampling system was constructed, incorporating a pair of positive displacement pumps with a total flow capacity of 2.8 m^3/sec (6000 cfm). A secondary tunnel for particulate sampling was included which takes samples on 90 mm filters. An additional secondary tunnel was appended for large scale particulate collection for use in EPA health-effects studies.

Nineteen engines were tested. Two of these engines were retested for correlation purposes.

A. Transient Test Results

The following table shows the high, average and low values for the 1979 or later engines:

	HC	CO	NO_x[a] (Continuous)	NO_x (Bagged)	Particulate	Fuel Consumption
High	2.28 (1.70)	6.77 (5.04)	11.66 (8.69)	10.71 (7.99)	0.97 (0.72)	288. (215.)
Avg.	1.11 (0.83)	3.06 (2.28)	9.44 (7.04)	8.25 (6.15)	0.66 (0.49)	269. (201.)
Low	0.52 (0.38)	1.93 (1.44)	6.90 (5.14)	5.71 (4.26)	0.48 (0.36)	249. (186.)

[a]Engines 9-22 only
g/kw-hr
(g/bhp-hr)

*Numbers in parentheses indicate references at the end of this report.

On the average, NO_x measured continuously was 12 percent higher than the bagged NO_x readings. However, the discrepancy ranged from 1 percent to 28 percent. This discrepancy was not "scatter" in the data, but was constant for a given engine.

B. Thirteen-mode Test Results

The following table shows the high, average, and low values for the 1979 or later engines. Particulate was not measured on the thirteen-mode tests.

	HC	CO	NO_x	Fuel Consumption
High	1.32 (0.98)	7.80 (5.82)	13.96 (10.41)	268. (200.)
Avg.	0.69 (0.51)	3.38 (2.52)	9.19 (6.85)	252. (188.)
Low	0.23 (0.17)	1.63 (1.22)	5.02 (3.75)	227. (169.)

g/kw-hr (g/bhp-hr)

C. Results of Other Tests

Two engines were tested using a modified transient cycle proposed by Caterpillar. Results from this cycle indicated that HC and CO averaged 16 and 11 percent lower, respectively. Particulate emissions were inconclusive as results showed little change in one case and about a 17 percent decrease in another case. NO_x showed little or no change.

One engine was tested on a "bus" cycle. All emissions were 10 to 15 percent higher than on the standard transient cycle.

An extensive series of steady-state and transient tests on one engine emphasized the need to keep the CVS tunnel vacuum low. On this engine, the tunnel vacuum had a significant effect on particulate emissions due to an interaction with the turbocharger lubrication system.

A particulate correlation program was conducted by bringing the EPA secondary tunnel to SwRI for side-by-side comparison. Steady-state tests showed no difference in the results obtained from the two tunnels. In transient tests, the EPA tunnel gave 15 percent higher particulate measurements than the SwRI tunnel. Swapping the inlet and outlet air systems between the two tunnels reversed the offset exactly, with the SwRI tunnel giving 15 percent higher readings than the EPA tunnel. The EPA tunnel was then returned to Ann Arbor for further study. No changes were made in the SwRI tunnel.

II. INTRODUCTION

On September 26, 1977, Contract No. 68-03-2603 was authorized by the Environmental Protection Agency. The objective of this project was to provide a baseline of exhaust emission data representative of actual operation from selected heavy-duty gasoline and diesel engines, to be used in establishing Federal emission standards for these types of engines. This report covers the diesel portion of the project. A companion report describes the gasoline program.

A. Project Overview

The requirement to perform tests using the proposed EPA transient cycle necessitated the development of a facility which would both control the engine operation and measure emissions during the transient operation. This was performed successfully during the first year of the project.

B. Scope of Work

The original scope of work, as it appeared in the contract, was the same as that set forth in the request for proposal. As experience was gained and new requirements were added, it eventually became necessary to revise the scope of work to reflect the evolution of the program. This was done in cooperation with the Project Officer. Major additions to the project included the requirements for 13-mode tests and the measurement of particulate during transient tests. Seemingly minor additions which required the expenditure of much additional effort were the requirements for humidity control of the engine inlet air and the requirement for continuous NO_x measurements during the transient tests. At the direction of the Project Officer, many additional tests were performed which became necessary to insure the integrity of the baseline program.

C. Project Reviews

A number of meetings, discussions and status reviews were held during the course of this project with the Project Officers and the other individuals at the EPA involved in this project. A pivotal meeting was held at the EPA in Ann Arbor on May 19, 1978. This meeting constituted a decision point to determine whether SwRI had succeeded in achieving the ability to perform a transient engine test. It was decided that SwRI would initiate baseline testing of gasoline engines (that facility was developed first) and would proceed on the development of the diesel dynamometer and particulate sampling system. Monthly progress, letter and telephone reports were issued or made to keep the Project Officer informed of the progress or problems encountered in the project.

This final report will first describe the operational equipment used to perform the tests conducted. This is followed by a description of the manner in which the transient and thirteen-mode tests were conducted. The test plan, fuel analyses, and data reduction methods are given. Following a listing of the engines, the test results are presented. A final section is included which describes other tests which were conducted at the request of the Project Officer.

III. OPERATIONAL EQUIPMENT

Conductance of the transient evaluations required the development and application of some advanced dynamometer control systems. In addition, environmental controls and double dilution of the exhaust were subsequently required. This section describes those equipment and controls utilized in this project.

A. Dynamometer and Controls

The overall control scheme for the transient tests consists of two independent closed loop systems. The speed is controlled by the dynamometer, and the torque by the engine. The alternate control scheme, i.e., torque control by the dynamometer, was briefly considered, but it was concluded that such a scheme could not lead to stable operation below the peak torque speed of the engine, particularly on turbocharged models.

The dynamometer system consists of a G.E. Type TLC-2564H D. C. dynamometer and a Midwest Type 1519W eddy current dynamometer, arranged on a commom shaft. The G.E. dynamometer has a capacity of 148 kW (200 horsepower) motoring and 196 kW (250 horsepower) absorbing. The Midwest dynamometer has an absorbing capacity of 373 kW (500 horsepower). A special control circuit was built which progressively turns on the eddy current dynamometer as the absorbing load increases on the G.E. dynamometer. This tandem arrangement made it possible to test all engines in the baseline project, one of which produced a peak power of 312 kW. Another necessary item was a "quick unload" exciter for the eddy current dynamometer. A proprietary circuit is used which unloads the coil in a fraction of a second. Nearly 10 seconds decay time is required with most commercial D.C. exciters.

The G.E. dynamometer is powered by an air-cooled SCR circuit built by Avtek Systems, Inc. in 1972. An auxiliary safety unit/console was built at the same time by Unisystems, Inc. Neither organization is in business at present. To provide transient command signals, equipment in use in the gasoline test cell was duplicated. It consists of a Remex paper tape reader and a Northern Ampower Corp. digital programmer, which provides continuous analog output, redirected at one second intervals. This system was purchased to be interchangeable with the system used on the gasoline test stand.

Speed control feedback is provided by a D. C. tachometer which is belt driven by the G.E. dynamometer.

The torque control loop consists of the following main elements:

- Analog command signal
- Servo amplifier
- Servomotor attached to throttle
- Driveshaft torquemeter
- Strain gage conditioner

The analog command from the Northern Ampower programmer is fed to the torque command inputs of the servo amplifier. The signal from the strain gage conditioner goes into the torque feedback input. An error amplifier decides the direction and magnitude of the current to the throttle servomotor. Two adjustments are available on the servo amplifier. The span control adjusts the torque command level appropriately for the engine being tested. The gain control adjusts the responsiveness of the system. It is adjusted to the position at which minor oscillation begins at a couple of points in the cycle. General views of the test stand are shown in Figures 1 and 2.

B. Environmental Controls

The diesel test cell has two environmental control systems. The first is a wall-mounted air conditioner which insures that the test cell is the proper temperature for an overnight cold soak. This unit does not have enough capacity to control cell temperature during engine operation. Beginning with engine No. 3, the Project Officer requested that humidity be controlled accurately to 10.7 g/kg (75 grains/lb) in order to eliminate NO_x emissions dependency upon a humidity correction factor. To accomplish this, a second system was constructed which provided conditioned air directly to the engine intake. Filtered air from outside the building is passed through a chilled water spray chamber to establish the proper absolute humidity level. The air then passes through a demister followed by an electrically heated reheat section to establish a 25°C (77°F) inlet temperature. Temperature and dewpoint are monitored as closely as practical to the engine inlet. Fuel supply is maintained at 38°C (100°F) by a heated return tank in the test cell.

C. Exhaust Dilution System

The exhaust dilution system is a double dilution system with a primary dilution tunnel and two secondary tunnels. It can simultaneously provide dilute gaseous samples and accumulate particulate on filters; both at appropriate dilutions for accurate measurement. The entire system is the positive displacement pump (PDP) design of constant volume sampling (CVS) system. Total flow capacity of the main tunnel is 2.8 m^3/sec (6000 cfm), variable in steps of 0.47 m^3/sec (1000 cfm). For purposes of the baseline, the CVS system turned out to be oversized by a factor of two. This was due to the fact that the system had to be sized before the final engine cycle had been determined. The largest engines tested (250 to 300 kW) were accommodated at 1.4 m^3/sec, while the smallest engines (below 175 kW) required only 0.5 m^3/sec. The necessary total flow rate was verified by checking for condensation in the sampling system during the Los Angeles Freeway (LAF) portion of the cycle. If no condensation were found,

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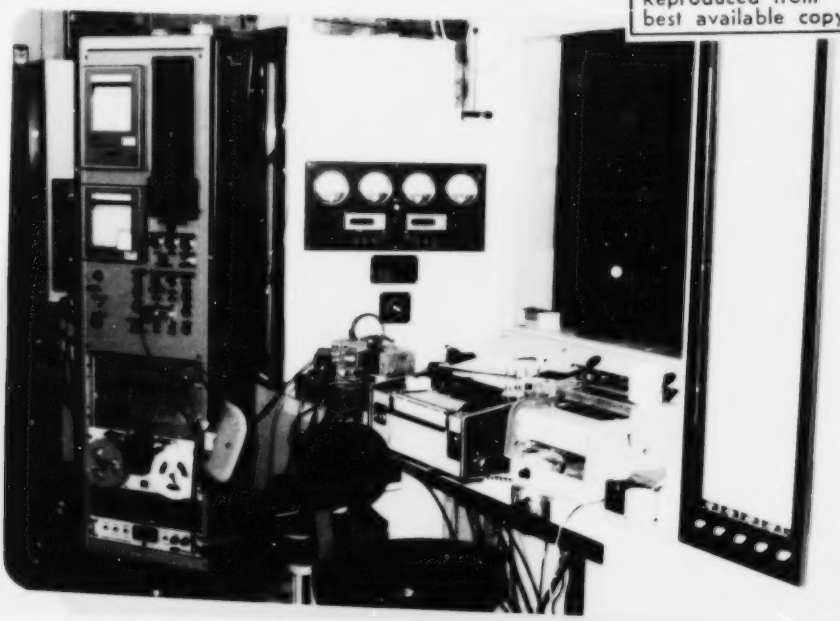

Figure 1. Diesel test stand console.

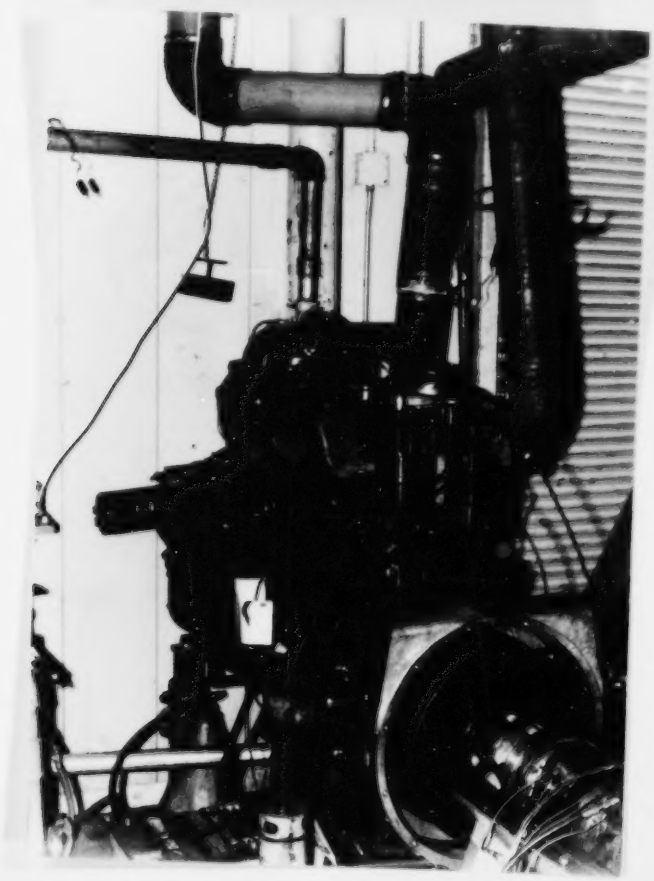

Figure 2. Mounted engine with driveshaft torquemeter.

total CVS flow was determined to be sufficient.

The overall configuration of the CVS system is shown in Figure 3. The main tunnel is conventional, but scaled up from light-duty practice. The 90 mm secondary tunnel is used for quantitative particulate measurements. The double dilution system is an aid to particulate measurement. At the dilution ratio appropriate to accurate gaseous measurement (about four to one, overall) the diluted mixture would be too hot to meet the maximum value (52°C, 125°F) for particulate collection. The additional dilution (about three to one) of the secondary tunnel, plus some unavoidable heat transfer through the walls, allows the maximum temperature criterion to be met. Particulate samples are taken in accordance with the Particulate Regulation for Heavy-Duty Diesel Engines.[1] Two Pallflex 90 mm filters were used in series. Views of the primary and secondary dilution tunnels are shown in Figures 4 and 5. Other details of the emissions measuring system are given in Figures 6 and 7.

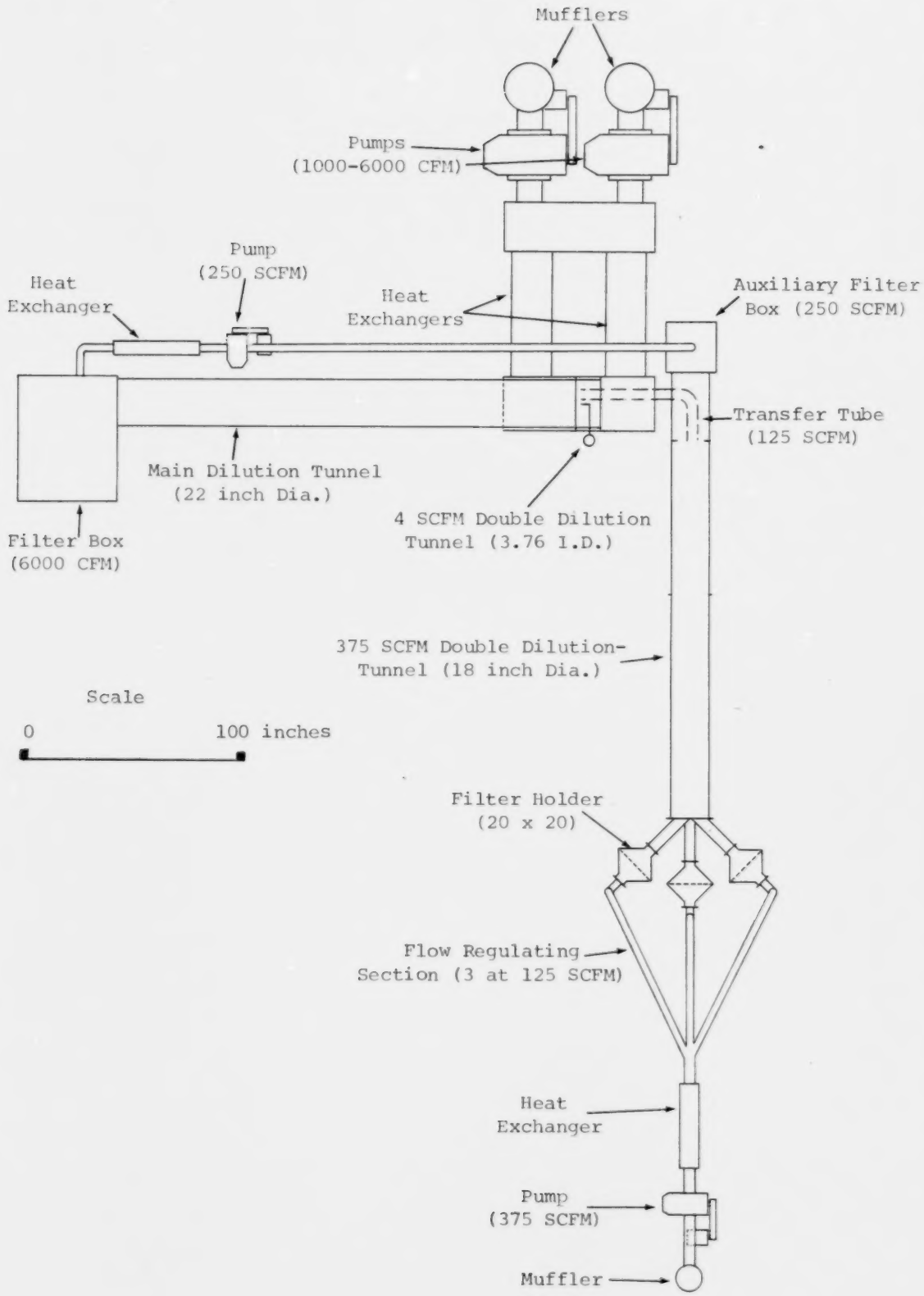

Figure 3. Basic layout of transient cycle heavy-duty diesel CVS with large double dilution sampler for three 20 x 20 filters.

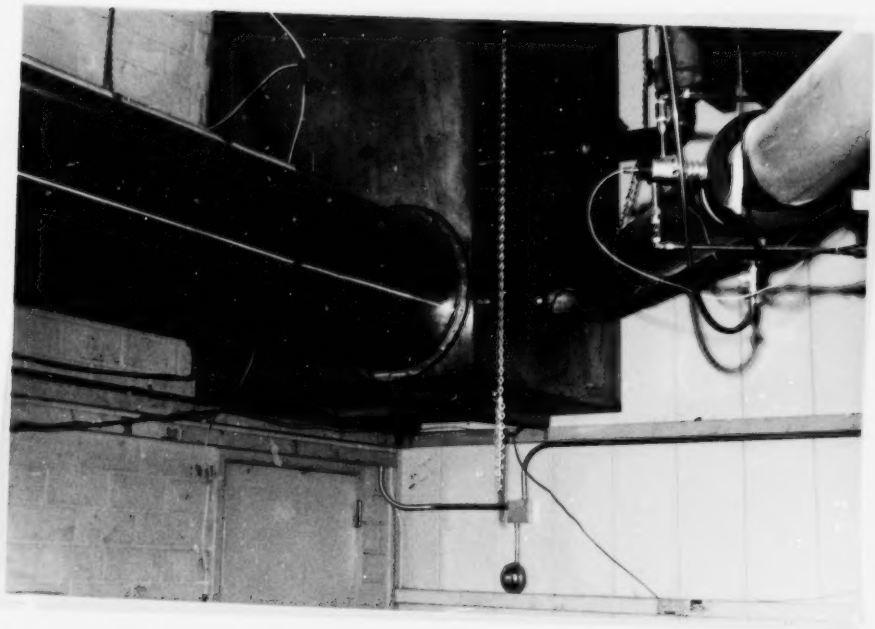

Figure 4. Primary dilution tunnel for EPA transient HD cycle.

Figure 5. Installation of new particulate filter on secondary tunnel (EPA transient HD cycle).

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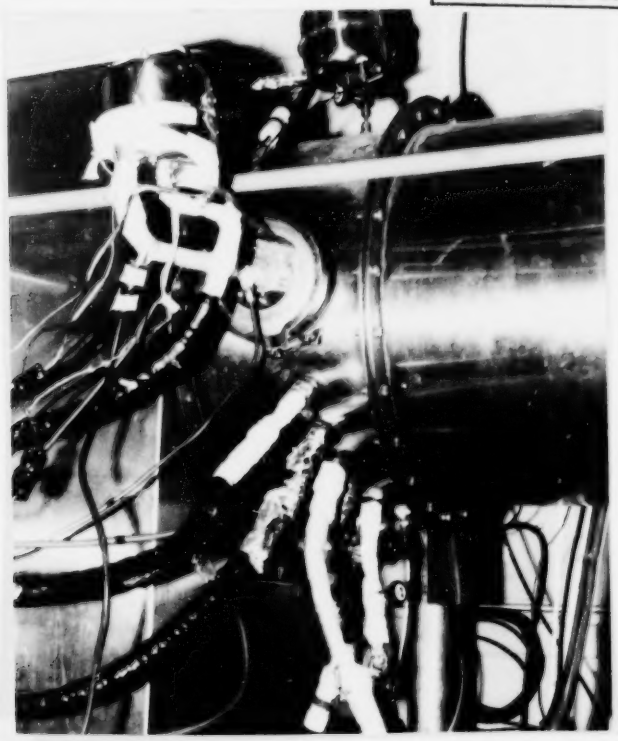

Figure 6. Heated probe filter and transfer for HC and NO_x continuous sampling.

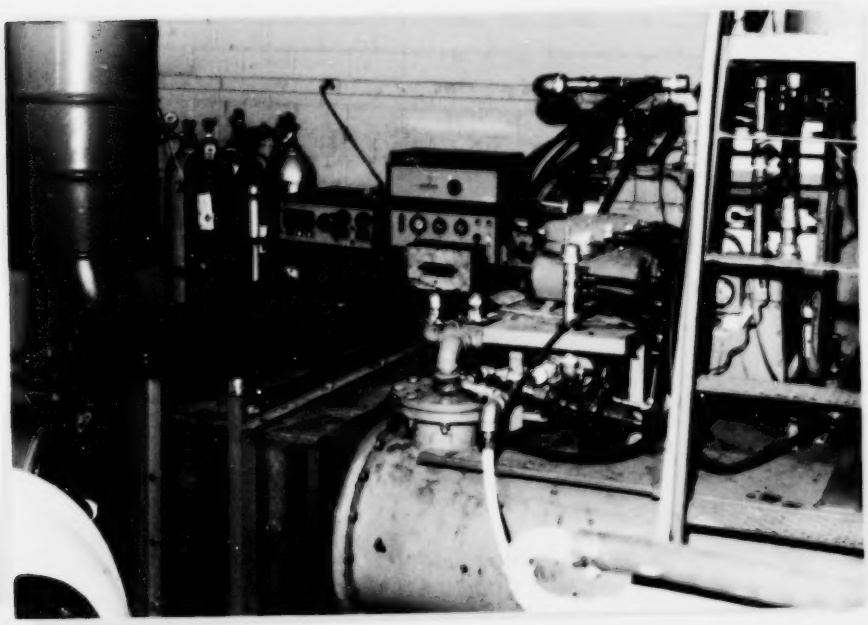

Figure 7. CVS positive displacement blower and heated flame ionization HC analyzer-Beckman 402.

IV. EMISSION SAMPLING AND ANALYSIS

All engines tested in this project were subjected to two basic tests, transient and 13-mode. In addition, other special tests were run on some engines at the request of the Project Officer. These tests ranged from alternate fuels (i.e., No. 1 diesel vs. No. 2) to extensive particulate correlation tests involving both transient and steady-state tests, as well as CVS modifications.

A. Transient Evaluations

The EPA transient test procedure is central to this project. Prior to the start of the contract, no facility existed for performing the proposed transient cycle on heavy-duty diesel engines. The recommended practice[2] intended to go into effect for 1983 engines existed only in draft form. Many elements of the final regulation[3], as enacted into law for 1984, evolved during the course of this project. To say that the diesel transient tests were performed in accordance with the Federal Register is true but somewhat misleading. Many specific items in the two appropriate Regulations[1,3] were determined by the experience gained under this contract.

The purpose of the transient test is to provide a more realistic simulation of on-the-road driving conditions during emission sampling than the previous steady-state tests could provide.

The transient test procedure, as enacted into law for the 1984 model year, is described in detail in Reference 3. The elements of the procedure, as conducted at SwRI during this baseline program are described below:

- The engine is mapped for maximum available torque versus speed over the range of speeds to be encountered during the transient test. This speed range is generally from 400 rpm to 13 percent above rated speed. The mapping is accomplished in a single sweep from low speed to high speed at a rate of 8 rpm per second. The torque curve thus established is then used to calculate the actual torques to be followed during the transient cycle.

- The required cycle is determined, at one second intervals, in terms of rpm and torque.

- Practice runs are conducted to insure that the regression line tolerances are being met. The purpose for the statistical limits is to insure that the engine follows the required speed-torque cycle closely enough that no significant variation in results can be attributed to deviation from the cycle.

• After an overnight soak, a cold-start transient test is run. Whereas the procedure calls for only a single emissions sample bag to be taken during the test, for baseline purposes four bags are taken, dividing the test into four subcycles. This resulted in emission factors useful in emission inventory and impact analyses.

• After a twenty-minute soak, the cycle is repeated for a hot-start test.

• The regression line data is analyzed to determine if the cycles were run within required tolerances.

• The emission data is analyzed and results for the cycle computed.

The following four gaseous emissions were measured:

- Hydrocarbons (HC)
- Carbon Monoxide (CO)
- Carbon Dioxide (CO_2)
- Oxides of Nitrogen (NO_x)

Hydrocarbon samples were extracted by means of a heated 16 mm diameter probe, supplied by the EPA. The sample is conducted through a heated 190°C (375°F) line to a Beckman 402 analyzer. The output signal of the analyzer is electronically integrated during the course of the test.

Continuous traces of exhaust opacity were recorded during the transient tests. These recorder charts are on file and available for examination, if desired.

B. Thirteen-Mode Evaluations

At least two thirteen-mode tests were run on each baseline engine. These tests were conducted in accordance with the 1979 Heavy-Duty Certification and Test Procedures.[4] The primary reason for these 13-mode tests was to verify proper engine operation by comparison with tests the manufacturers had previously run. When possible, these steady-state tests were run prior to the transient tests. However, when doing so would delay the transient test schedule, the 13-mode tests were rescheduled to accommodate the transient schedule.

Thirteen-mode tests were run on the same dynamometer as the transient tests. Speed was set by the dynamometer and load was set and monitored by the torquemeter-throttle servo system.

V. TEST PLAN, FUELS, AND DATA REDUCTION

The test plan, which evolved significantly during the program, is shown in its final form in this section. For reference, the original test plan is shown in Appendix G.

A. Test Plan

The original test plan is shown in Appendix G. The two main changes in the plan of performance for diesel engines involved the addition of particulate measurement. The taking of 90 mm diameter filters for quantitative particulate measurement was instituted prior to the testing of Engine 1. Twenty by twenty inch particulate filters were taken beginning with Engine 4. These filters were not part of the baseline programs, but were taken to support other EPA health-effects studies. An additional change not shown in this Scope of Work is the taking of NO by continuous measurement. This was the primary method of NO measurement from Engine 9 on. The final Scope of Work is as follows:

Contract No. 68-03-2603

Exhibit A

Scope of Work

The contractor shall test gasoline and diesel-type heavy-duty engines by the test procedures authorized below. The engines will be supplied by EPA.

A minimum of 22 gasoline engines and a minimum of 23 diesel engines shall be tested. In lieu of engines, up to 20 vehicles may be supplied by EPA. The contractor shall remove, test, and replace the engines. Vehicles shall be returned in the same general condition as received.

The Test Procedures, Equipment Specifications, and Calibration Procedures are outlined below. The detailed procedures shall be found in: Title 40 of the Code of Federal Regulations, Part 86, Subpart D, "For 1979 and Later Model Year Heavy-Duty Engines", as published in the Federal Register, September 8, 1977, pp. 45154 - 45174; revised Title 40 of the Code of Federal Regulations, Part 86, Subpart P and N, "For 1984 and Later Model Year Heavy-Duty Engines", as published in the Federal Register, January 21, 1980, pp. 4136 - 4227; and "Draft Recommended Practice for Measurement of Gaseous and Particulate Emissions from Heavy-Duty Diesel

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Engines Under Transient Conditions", EPA Technical Report No. SDSB-79-18, by E. Danielson, April 1979. Deviation from the procedures referenced above, substitution of additional procedures within the scope of technical direction, or substitution of procedures which supersede those procedures referenced above, shall be made only with prior approval of the EPA Project Officer.

I. Test Procedure

1. Receipt of Engine

a. The EPA Project Officer shall specify which engines are to be tested.

b. Engines will be furnished by EPA to the test facility. The contractor shall examine the engines for damage during shipment and will verify that the engine delivered is the same as specified by the EPA Project Officer. EPA will ensure that the contractor, at any time, has at least one engine on hand for testing until the total quantity of engines has been tested.

2. Engine Adjustment

a. All new engines shall be checked to determine:

1) Idle speed;

2) Rated power;

3) Rated speed;

4) Rated torque.

These checks shall be made with the engine warmed up. If the items checked are outside of the recommended specifications, the EPA Project Officer shall be notified. Subsequent action may include troubleshooting, engine adjustment, and mechanical repair.

b. All in-use engines shall be checked for operational integrity using procedures specified by the EPA Project Officer. These checks shall include, at a minimum:

1) Visual inspection, including verification that the carburetor and distributor are the proper parts for the engine being tested;

2) Cylinder compression check (warm).

The criteria against which the engine's integrity shall be checked shall be specified by the EPA Project Officer, who shall be notified if the engine fails checkout, and who shall direct any subsequent action. Subsequent action may include mechanical repair or engine rejection.

c. Following initial checkout, all in-use engines shall be subjected to major tune-up. What constitutes a major tune-up shall be prescribed by the EPA Project Officer, as will guidance and assistance should tune-up specifications be unattainable. Major tune-ups may require at a minimum:

1) Replacement and/or adjustment of ignition-related parts;

2) Possible mechanical repair;

3) Recording of "recommended" and "as-tune" specifications in a format to be specified by the EPA Project Officer.

3. Steady-State Emissions Testing

a. Following engine checkout and any required adjustments, all engines shall be tested per Title 40 of the Code of Federal Regulations, Part 86, Subpart D, using a modified version of the "9-mode" Test Procedure for Gasoline Engines, or the "13-mode" Test Procedure for Diesel Engines.

b. A total of two (2) complete tests are required, with a third test recommended if emission results from the first two tests are inexplicably variable.

c. These steady-state tests may, at the discretion of the contractor and the EPA Project Officer, serve as further checks on engine integrity, over and above those specified above.

4. Transient Emission Testing

a. Transient emission testing shall be conducted and validated per title 40 of the Code of Federal Regulations, Part 86, Subpart N. In Summary, such testing shall consist of:

1) Generation of maximum torque curve (mapping);

2) Generation of the transient reference cycle;

3) Pre-test engine soak or cool down;

4) Cold-start transient cycle lasting approximately twenty (20) minutes during which emissions are sampled;

5) A twenty (20) minute soak with the engine off;

6) Hot-start transient cycle, lasting approximately twenty (20) minutes, during which emissions are sampled;

7) Emission calculations and test cycle validation.

b. A total of two (2) complete and valid tests are required, with a third test recommended if emission results from the first two are inexplicably

variable. Generation of an engine map and the reference cycle need only be done once per engine, however.

5. Additional Testing

a. Limited additional testing for both research purposes and for checks on engine integrity may be required at the direction of the EPA Project Officer. Such additional testing may include idle emission tests, emission testing over alternate transient cycles, and the sampling of additional gases and exhaust matter during the standard tests.

6. Release of Engine

a. Upon completion of testing the contractor shall notify the EPA Project Officer for approval to discontinue testing. After such approval is given, the Project Officer will arrange to assume custody within a reasonable time.

II. Specifications and Equipment Requirements

1. Test Cycle

a. The test cycle is defined in terms of "normalized" speed and power. For speed, 0% indicates idle rpm and 100% is usually the manufacturers rated rpm for maximum power. For torque, 0% is no torque and 100% is the maximum torque which the engine can produce at a given engine speed. Other values are linearly related to the two set points. Negative values indicate an engine speed below idle or a motoring condition.

b. The test cycle is defined by a curve through the specified speed and torque sequences.

2. Dynamometer and Engine Equipment

a. The dynamometer shall be capable of performing the test cycle within the specified tolerances. The engine cooling system shall maintain (approximately) the manufacturers specified operation temperature.

b. Engine speed and torque shall be continuously recorded. In addition, the deviation from the test cycle shall also be shown to verify test validity.

3. Exhaust Gas Sampling System and Analyzers

a. The sampling system and gas analyzer shall conform to the specifications found in the appropriate Subparts of Title 40 of the Code of Federal Regulations, Part 86, or as specified by the EPA Project Officer.

4. Analytical Gases, Fuel, Calibration Procedure

a. The analytical gases, fuels, and calibration procedures shall conform to the specifications found in the appropriate Subparts of Title 40

of the Code of Federal Regulations, Part 86, or as specified by the EPA Project Officer.

III. Additional Testing (Diesel Engines)

1. Particulates and Hydrocarbons

a. In addition to gaseous emission measurements, measurements of diesel particulate emissions shall be made during each transient emission test.

b. Both particulate and hydrocarbon measurements shall be made in accordance with "Draft Recommended Practice for Measurement of Gaseous and Particulate Emissions from Heavy-Duty Diesel Engines Under Transient Conditions", EPA Technical Report No. SDSB-79-18, by E. Danielson, April 1979, or as directed by the EPA Project Officer.

c. High-volume sampling of diesel particulates shall be made during all transient emission testing using equipment and procedure to be agreed upon between EPA and the contractor. High-volume particulate samples shall be stored in accordance with accepted scientific practice and shall be made available for distribution to outside laboratories.

2. Smoke

a. Continuous traces of exhaust opacity (approximately 6 inches/minute) shall be supplied for all transient diesel testing. An in-line smokemeter shall be used. Smokemeter malfunctions shall not void the exhaust emissions tests.

IV. Data Submission

1. Data Submission

a. Test results shall be submitted in two manners, packets and punched (and interpreted) 80-column cards. Formats for these submissions shall be specified by the EPA Project Officer.

b. Test results for each engine shall be submitted within a reasonable time after completion of each engine.

c. Strip charts and test notes shall be retained and submitted as requested by the Project Officer.

B. Fuels and Lubricants

Several batches of No. 2 fuel were used over the duration of the baseline program. Analyses of these fuels are shown in Table 1.

TABLE 1. ANALYSES OF FUELS

	Number 2				Number 1
Batch, EM-xxx-F	273	321	408	465	400
Cetane	46.5	--	50.	44.	39.0
Distillation:					
IBP, °F	370	382	373	334	374
10%, °F	410	408	443	416	398
50%, °F	481	488	506	500	418
90%, °F	595	582	602	596	461
EP, °F	660	660	659	648	560
Gravity, °API	36.7	36.9	36.3	34.5	42.9
Total Sulfur, %	0.27	0.29	0.28	0.24	0.18
Aromatics, %	30.0	30.5	32.7	28.4	16.2
Flash Point, °F	158.	155.	178.	136.	140.
Viscosity, CS	2.41	2.40	2.8	2.42	1.7

The following list identifies the fuels used with each engine:

EM-273-F, Engines 1 and 2
EM-321-F, Engines 3-10
EM-408-F, Engines 11-18
EM-465-F, Engines 19-22

A single batch of No. 1 fuel was used for those engines requiring it. The analysis is shown in Table 1.

Unless the manufacturer requested a different specification, the crankcase oil used in all engines was a major brand SAE 30 oil with an SE-CD rating. Engines which arrived with a full crankcase were run without changing the oil.

C. Data Reduction

Data taken from the engine tests included two categories:

- Test Validation
- Emissions Data

Test validation was achieved by means of a Fluke 2240B Datalogger, which scanned the speed and torque command and feedback channels, as well as the throttle position, once per second. The channel scan rate of 15 channels per second, and the order of scanning, resulted in a 200 millisecond delay between recording of the torque command and feedback signals. At the same time, a 70 millisecond delay was experienced between the recording of the speed command and feedback signals. This information was recorded in a suitable format on 7-track tape. The tape was then read into a Hewlett-Packard computer at a neighboring department of the Institute. A sample printout and the computer program are in Appendix F. An additional

requirement was that the integrated work for the cycle must fall within the limits of +5 to -15 percent of the calculated reference work. This was determined by continuously integrating a horsepower feedback signal derived from the torque and speed feedback signals.

Emissions data reduction was conducted in accordance with the "Gaseous Emission Regulations for 1984 and Later Model Year Heavy-Duty Engines," and the proposed "Particulate Regulation for Heavy-Duty Diesel Engines." HC was taken by continuous measurement on all engines. Starting with Engine No. 9, NO_x was also taken by continuous measurement. Dilute gas samples were also collected in bags and analyzed on a bag analysis cart for CO, CO_2, and NO_x. The computer programs and subroutines used in calculating the transient emissions were derived from the bag analysis programs already in use for light-duty testing. Primary differences were made to accommodate the following:

- The transient cycle was divided into four segments (NYNF, LANF, LAF, NYNF) and bags taken for each. The computer programs gave emission values for each segment, as well as a composite for the entire cycle.

- Beginning with engine number 9, the NO_x correction factor was set equal to 1.00. This was made possible because of control exercised over the engine inlet air temperature and humidity. Temperature was controlled to 25 °C ±5 and humidity was controlled between 8.6 and 12.8 g/kg. (60-90 grains/lb of dry air). In general, humidity control was between 70 and 80 grains/lb of dry air. Prior to this humidity control, the NO_x correction factor varied from -19% to +23%. After humidity control was installed (Engine No. 3), the maximum NO_x correction factor variations were -6 and +10%.

VI. EMISSIONS BASELINE TESTING

The diesel baseline testing involved nineteen engines, two of which were tested twice. Emissions were evaluated in transient and thirteen-mode tests.

A. Engines Tested

All diesel engines tested in this program were supplied by the manufacturers, either directly or through the EPA, Ann Arbor. Most were 1979 models, one was 1980, three were 1978, and one was 1976. Another 1976 model was converted to 1979 specifications by the local factory service organization before testing. Because these were essentially new engines, straight from the manufacturers, no tune-up was generally required. Proper operation was verified (max power and torque) and, if the idle speed was more than 50 rpm from specification, it was reset. The engines tested are listed in chronological order in Table 2.

B. Emissions Test Results

A summary of the emission results for the transient and 13-mode tests is presented in Table 3. Beginning with Engine 9, NO_x was measured by continuous integration, as well as by sample bag. Engines 3, 5, 6, and 11 were tested with alternate fuels. These results are included with the baseline summaries in Appendix A. Computer printouts of the test data are in Appendix B. Additional printouts showing bagged NO_x values are in Appendix C. Appendix D contains the detailed 13-mode test results.

Engines 1, 2, 3, and 5 were not 1979 or later models. This was due to an initial misunderstanding between EPA and the Engine Manufacturer's Association. Engine 8 was withdrawn by the manufacturer after initial 13-mode tests showed it to be unrepresentative. Engine 22 was originally a 1976 model, but it was converted to 1979 specifications by the manufacturer's local service organization.

TABLE 2. ENGINE TEST CHRONOLOGY

Engine No.	Description	Notes & Special Tests
D-1	Caterpillar 1978 3208 Dina Family 3 Ser. No. 1A6791	7 valid tests Steady-state mapping
D-2	Cummins 1976 NTC-350 (high volume) Ser. No. 10527097	Steady-state mapping and Transient mapping
D-3	Detroit Diesel Allison 1978 6-V92T (high volume) Ser. No. 6VF001205	Additional tests on No. 1 fuel
D-4	Cummins 1979 NTCC-350 (advanced technology) Ser. No. 10677685	Transient map established Additional test using Cat-terpillar-supplied cycle. 20X20 Filters operational
D-5	Detroit Diesel Allison 1978 8V071N Coach (unique design) Ser. No. 8VA377265	Caterpillar cycles #1 Fuel Bus Cycles 90 mm Millipore filter tests
D-6	Detroit Diesel Allison 1979 6V-92TA 10g Fed. (unique design) Ser. No. 6VF025390	#2 Fuel
D-7	International Harvester 1979 DTI-466B (advanced technology-intercooled, California 7-1/2 g. NO_x calibration) Ser. No. 19084	
D-8	Deutz 1979 F5L-912 (high volume)	Withdrawn by manufacturer
D-9	Mack 1979 ETAZ(B)673A (high volume) Ser. No. 8D3300	Continuous NO_x measurements established
D-10	Mack 1980 ETSX676-01 (advanced technology, California Calibration)	
D-11	Cummins 1979 VTB-903 Coach Ser. No. 10847565	No. 1 Fuel Changed turbo & retested
D-12	Caterpillar 1979 3406 Dita Family 16 Ser. No. 1A6709	

TABLE 2. (Cont'd). ENGINE TEST CHRONOLOGY

Engine No.	Description	Notes & Special Tests
D-13	Caterpillar 1979 3406PCTA Family 10 (unique design) Ser. No. 1A6877	
D-14	Cummins 1979 Big Cam NTC-350 (Unique design) Ser. No. 10527097	
D-15	International Harvester 1979 DT-466 (High volume) Ser. No. 109424	
D-16	Detroit Diesel Allison 1979 6V-92TA (90mm injectors) Ser. No. 6VF-25392	
D-17	Detroit Diesel Allison 1979 8V-71TA (high volume) Ser. No. 8VA-x517	
D-18	Cummins 1979 NTC-290 (high volume) Ser. No. 10665897	Converted from '76 66 S.S Particulate 21 Transient particulate
D-19	International Harvester 1979 DTI-466B (Same engine as D-7)	3 Cold-Starts 12 Hot-Starts
D-20	Used by another EPA project	
D-21	Caterpillar 1979 3406 Dita Family 16 (Same engine as D-12)	Particulate correlation tests. 41 transient 19 Steady-State
D-22	Cummins 1979 NH-250 (unique design) Ser. No. 10601832	12 Steady-State Particulate

TABLE 3. SUMMARY OF BASELINE TEST RESULTS

Engine No.	Manufacturer	Model	Fuel Type	Transient HC	Transient CO	Transient Continuous NO_x	Transient Bagged NO_x	Transient Fuel	Transient Part.	Transient Work	13-Mode[c] HC	13-Mode[c] CO	13-Mode[c] NO_x	13-Mode[c] Fuel
1	Caterpillar	3208[d]	2D	4.53	5.09	--	7.83	269.	1.06	8.99	2.28	4.57	5.40	260.
2	Cummins	NTC350[d]	2D	0.91	6.69	--	11.41	281.	0.81	15.89	0.32	2.94	12.54	261.
3	DDA	6V92T[d]	2D	1.04	4.22	--	9.55	267.	0.72	13.49	0.75	3.41	11.54	263.
4	Cummins	NTCC-350	2D	1.16	3.47	--	6.58	258.	0.52	15.45	0.43	4.42	7.72	249.
5	DDA	8V-71N[d]	1D	2.04	5.05	--	7.15	286.	0.92	12.03	1.13	8.62	9.50	278.
6	DDA	6V-92TA	1D	1.56	2.00	--	7.80	277.	0.65	11.12	1.32	2.32	9.75	264.
7	International	DTI-466B	2D	1.11	1.98	--	7.46	285.	0.48	9.08	0.80	1.63	7.63	268.
8	Deutz	F5L-912	Not Tested		--	--	--	--	--	--	--	--	--	--
9	Mack	ETAZ	2D	1.07	2.36	9.01	7.04	249.	0.77	14.87	0.76	1.74	8.18	238.
10	Mack	ETSX	2D	0.52	2.18	6.90	5.71	281.	0.85	15.00	0.47	2.45	5.03	249.
11	Cummins	VTB-903	2D	1.85	1.93	8.10	7.03	278.	0.53	12.21	0.96	2.20	9.29	254.
12	Caterpillar	3406DITA	2D	0.81	4.31	11.28	9.93	256.	0.69	18.11	0.39	4.06	9.67	227.
13	Caterpillar	3406PCTA	2D	0.64	2.71	7.24	6.86	269.	0.49	17.85	0.23	2.23	6.98	250.
14	Cummins	NTC-350-BC	2D	0.83	2.15	9.97	9.14	262.	0.54	14.99	0.51	3.52	10.35	240.
15	International	DT-466	2D	1.13	2.78	7.91	7.60	258.	0.71	8.82	0.90	3.31	7.98	262.
16	DDA	6V92TA-90mm	2D	1.01	3.80	11.66	10.65	271.	0.73	14.64	0.91	3.91	11.77	254.
17	DDA	8V-71TA	2D	0.78	3.20	9.81	9.68	276.	0.51	15.43	0.85	4.15	11.04	264.
18	Cummins	NTC-290	2D	1.08	3.24	11.10	10.71	261.	0.78	12.99	0.45	3.61	13.96	242.
19[a]	International	DTI-466B	2D	0.89	2.11	7.70	7.64	261.	0.42	9.42	--	--	--	--
20[b]	--	--	--	--	--	--	--	--	--	--	--	--	--	--
21	Caterpillar	3406DITA	No baseline tests run			--	--	--	--	--	--	--	--	--
22	Cummins	NH-250	2D	2.28	6.77	10.87	9.29	288.	0.97	11.32	0.68	7.80	9.37	260.

[a] One test only

[b] Non-baseline engine

[c] Standards:

	CO	$HC+NO_x$
1974-1978	53.6	21.5
1979	33.5	13.4

[d] Designed to pre-1979 standards

Emissions in g/kW-hr, work in kW/hr,
Fuel in g fuel/kW-hr

VII. OTHER TESTS CONDUCTED

For diesel engines, the baseline program called for two thirteen-mode tests and two transient tests. Inevitably, questions arise which demand timely answers. As this facility was the only one available during the first part of the baseline, the Project Officer used his discretion to interrupt the baseline program for special tests when needed. Because of this, only twenty-one engines were tested instead of the originally planned twenty-five.

Most of the extra tests fell into one of the following categories:

- Initial dynamometer and CVS proving
- Alternate fuels
- Alternate cycles
- Correlation tests

The initial start-up of the dynamometer required the equivalent of about five test cycles before acceptable statistics were realized.

Engines were normally run with the intended fuel, i.e., number 2 for truck engines and number 1 for bus engines. However, at the request of the Project Officer, Engines 3, 5, 6, and 11 were given a complete test program on both fuels. These results are included with the baseline summaries and computer printouts in Appendices A and B.

At the beginning of the project, the only cycles planned for testing were the 1979 thirteen-mode cycle and the proposed 1983 transient cycle. The torque map of the engine was to be obtained by a steady-state mapping procedure. By the time the second engine was being tested, a manufacturer had suggested a transient mapping procedure which would allow mapping over the complete speed range without undue stress on the engine or dynamometer system. This procedure consists of a continuous sweep in engine speed from below curb idle to high idle at a rate of about 8 rpm/second. This procedure was tried on Engines 2 and 3 and was established as standard practice starting with Engine 4.

A modified transient cycle was suggested by Caterpillar Tractor Company. The purpose of this cycle was to allow tests to be run on dynamometers which did not have motoring capability, through the use of added inertia in the dynamometer system. This cycle was run on Engines 4 and 5.

For Engine 4, a comparison of two complete transient tests on each cycle gave the following results. All units are in grams per kW-hr.

Cycle	HC	CO	NO_x	Part.	Fuel Cons.
EPA	1.16	3.47	6.58	0.52	258.
Cat.	0.94	2.95	6.62	0.55*	244.

*One run only

The Caterpillar cycle was run on Engine 5 as a hot-start comparison only. Number 2 fuel was used, which was not the baseline fuel for this engine. Four tests were run on each cycle.

Cycle	HC	CO	NO_x	Part.	Fuel Cons.
EPA	1.92	5.68	7.00	1.21	283.
Cat.	1.67	5.23	7.09	1.01	283.

Another cycle, supplied by the EPA, was simply called "the bus cycle." It was produced as part of the CAPE-21 program. It is a 15 minute cycle which is considerably more active than the 20 minute standard transient cycle. Engine 5 was tested using this bus cycle in addition to the standard tests.

Bus cycles were run on Engine 5 as hot-starts only, on Number 1 fuel. Average emissions results from six runs were:

HC	CO	NO_x	Part.	Fuel Cons.
2.30	5.58	7.80	1.10	290.

Computer printouts of the Caterpillar and bus cycle tests are contained in Appendix E.

A brief test of an alternate filter media (1 micron Fluoropore) was also made on Engine 5. This type of filter was concluded by the Project Officer to be unsuitable for this use due to plugging problems.

Following baseline testing of Engine 18, the Project Officer initiated a series of steady-state tests to try to establish a procedure for correlation of particulate measurements. The plan was to run a steady-state series at the following conditions:

RPM	TORQUE
1300	50%
1300	100%
1900	100%

It soon became apparent (Table 4, Runs a through e) that the 125°F temperature limit at the filter could not be maintained in the 100% torque modes. The CVS flow was increased from 2000 to 4000 cfm. As adjustments

TABLE 4. STEADY-STATE PARTICULATE TEST SUMMARY
1979 Cummins NTC-290 (Engine 18)

Test No.	RPM	Load	CFM	∇P_f "H_2O	Wt. Gain,mg	Time, min.	Grams/ 20 min.	Filter Peak Temp.°F	CO_2 Grams/ Sec.
a.	1300	50%	2000	31.5	6.719	20	8.31	103	
b.	1300	50%	2000	33.0	6.525	20	7.84	107	
c.	1300	100%	2000	27.0	7.242	20	8.17	127	
d.	1300	100%	2000	28.0	6.006	20	7.33	130	
e.	1900	100%	2000	23.0	6.691	20	8.03	130	
f.	1300	100%	4000	15.5	4.171	20	9.96	112	
g.	1300	100%	4000	16.0	3.985	20	9.32	116	
h.	1300	100%	4000	29.5	3.418	20	6.98	110	
i.	1300	100%	4000	29.0	3.449	20	6.83	114	
j.	1300	100%	4000	40.2	4.832	20	7.03	117	
k.	1300	50%	3000	38.5	7.223	40	7.50	103	
l.	1300	50%	3000	34.3	7.531	40	7.90	104	
m.	1300	100%	3000	26.0	6.084	40	6.77	120	
n.	1300	100%	3000	28.0	6.160	40	6.31	124	
o.	1900	100%	3000	18.0	7.216	40	10.24	126	
p.	1900	100%	3000	30.0	7.665	40	10.24	115	
1.	1300	50%	3000	30.0	3.368	15	7.77	102	17.51
2.	1300	50%	3000	35.0	6.751	30	7.80	114	
3.	1300	50%	3000	20.5	4.730	15	12.04	102	
4.	1300	50%	3000	52.0	11.367	30	13.50	116	
5.	1300	0%	3000	16.0	3.167	30	3.63	90	3.07
6.	1300	0%	3000	14.0	3.763	30	4.36	90	3.28
7.	1300	50%	3000	33.0	6.761	30	7.99	103	17.71
8.	1300	50%	3000	21.0	3.169	15	7.49	103	17.03
9.	1300	50%	3000	31.0	6.378	30	7.59	107	16.98
10.	1300	50%	3000	21.5	3.229	15	7.57	106	16.90
11.	1300	50%	2000	32.5	6.067	20	7.15	105	17.20
12.	1300	0%	2000	16.5	2.483	20	2.92	91	2.94
13.	1300	50%	2000	29.0	5.866	20	7.31	109	17.30
14.	1300	0%	2000	--	2.687	20	3.25	93	3.12
15.	1300	50%	1000	32.5	4.986	10	7.01	120	17.54
16.	1300	0%	1000	17.5	2.172	10	3.08	100	3.57
17.	1300	50%	1000	30.0	4.640	10	6.63	120	17.78
18.	1300	0%	1000	23.0	2.242	10	3.16	100	3.31

TABLE 4 (Cont'd). STEADY-STATE PARTICULATE TEST SUMMARY
1979 Cummins NTC-290 (Engine 18)

Test No.	RPM	Torque	CFM	Min.	Grams/ 20 min.	Filter flow/ Sample flow
--	1300	50%	3000	40	7.50	3.47/1.37
--	1300	50%	3000	40	7.90	3.43/1.35
1.	1300	50%	3000	15	7.77	3.74/1.65
2.	1300	50%	3000	30	7.80	3.72/1.64
3.	1300	50%	3000	15	12.04	3.60/1.49
4.	1300	50%	3000	30	13.50	3.68/1.59
5.	1300	0%	3000	30	3.63	3.79/1.65
6.	1300	0%	3000	30	4.63	3.76/1.63
7.	1300	50%	3000	30	7.99	3.73/1.60
8.	1300	50%	3000	15	7.49	3.69/1.60
9.	1300	50%	3000	30	7.59	3.69/1.59
10.	1300	50%	3000	15	7.57	3.71/1.61
11.	1300	50%	2000	20	7.15	3.79/1.67
12.	1300	0%	2000	20	2.92	3.72/1.62
13.	1300	50%	2000	20	7.31	3.69/1.57
14.	1300	0%	2000	20	3.25	3.70/1.62
15.	1300	50%	1000	10	7.01	3.72/1.62
16.	1300	0%	1000	10	3.08	3.68/1.59
17.	1300	50%	1000	10	6.63	3.68/1.59
18.	1300	0%	1000	10	3.16	3.69/1.61
19.	1300	50%	5000	50	7.95	
20.	1300	0%	5000	50	3.34	
21.	1300	50%	5000	50	7.84	
22.	1300	0%	5000	50	3.33	
23.	1300	50%	6000	60	7.15	3.62/1.54
24.	1300	0%	6000	60	3.25	
25.	1300	0%	6000	60	3.81	
26.	1300	50%	6000	60	7.16	
27.	1300	0%	4000	40	3.87	3.65/1.54
28.	1300	50%	4000	40	7.21	3.58/1.50
29.	1300	0%	4000	40	3.45	3.66/1.53
30.	1300	50%	4000	40	7.13	3.64/1.53
31.	1300	0%	4000	40	3.40	3.69/1.56
32.	1300	50%	4000	40	9.24	3.65/1.54
33.	1300	0%	4000	40	4.04	3.66/1.53
34.	1300	50%	4000	40	7.74	3.69/1.60
35.	1300	0%	4000	60	4.04	3.59/ .76
36.	1300	50%	4000	60	6.50	3.61/ .78
37.	1300	0%	4000	20	3.52	3.63/2.30
38.	1300	50%	4000	20	8.34	3.70/2.37
39.	1300	0%	4000	20	3.28	3.76/2.40
40.	1300	50%	4000	20	8.05	3.76/2.41

TABLE 4 (Cont'd). STEADY-STATE PARTICULATE TEST SUMMARY
1979 Cummins NTC-290 (Engine 18)

Test No.	RPM	Torque	CFM	Min.	Grams/ 20 min.	Filter flow/ Sample flow
41.	1300	0%	4000	60	3.70	3.64/ .83
42.	1300	50%	4000	60	6.89	3.66/ .85
43.	1300	0%	4000	50	3.93	3.58/1.55
44.	1300	50%	4000	50	7.51	3.56/1.55
45.	1300	0%	4000	50	3.42	3.60/1.60
46.	1300	50%	4000	50	7.95	3.45/1.44
47.	1300	0%	4000	15	3.50	3.64/3.64
48	1300	50%	4000	15	8.16	3.64/3.64
49.	1300	0%	4000	15	3.21	3.67/3.67
50.	1300	50%	4000	15	8.27	3.75/3.75

were made to the secondary tunnel parameters (Runs f through j), a shift occurred in the particulate results obtained with no apparent reason. A series of tests were then run at 3000 cfm (Runs k through p). Each pair of tests run at each of the three conditions showed good repeatability.

The next phase of testing was designed to determine if the testing time affected the results. All tests were run at 1300 rpm and 50% and 0% torque. In tests 1 through 4, an apparent shift occurred between Tests 2 and 3. The tests were repeated (7 through 10) and confirmed the results of Tests 1 and 2. Discounting Tests 3 and 4, there appears to be no effect of testing time on the indicated particulate.

The next series of tests, 11 through 34, (Table 4), was designed to determine whether there was an effect of the main tunnel dilution ratio on particulate. These data, plus some later data at 4000 cfm are plotted in Figure 8.

In Tests 35 through 50, the effect of varying the secondary dilution ratio on particulate was explored while holding the main tunnel flow constant. These are plotted in Figure 9.

Although some weak trends seemed apparent, great caution was exercised in the use of these results. For instance, in Figure 8 a maximum particulate emission response could be inferred in the 50% torque data in the neighborhood of 4000 to 5000 cfm. Any similar trend in the 0 torque data is less visible. In Figure 9, measured particulate appears to decline with increasing dilution for the 50% torque data and increase, if anything, in the 0 torque data. The transient cycles fall in between these operating points with respect to average load, but have the added feature of transient operation. In addition, until other engines are put through similar tests, no attempt should be made to apply these results generally.

Because the data in Figure 8 suggested there might be an effect of CVS flow rate on measured particulate, a series of tests was run to determine whether the effect was present during transient testing.

Results of this series of tests are shown in Table 5. At the conclusion of Test D18-13, a strong peak in particulate seemed evident at 4000 cfm. Tests D18-14 through D18-21 were run in an attempt to confirm these results. Even higher values were obtained at 4000 cfm; the repeats at 1000 cfm were almost identical, while the repeats at 2000 cfm were slightly lower than the earlier tests (Figure 10.)

The variable particulate results aroused suspicion of an oil leak from the turbocharger. Removing the exhaust pipe from the turbocharger after a transient cycle at 4000 cfm revealed a few fresh streaks of oil in the turbine outlet. Consultation with the local Cummins service manager brought to light the following information. The oil seal in the exhaust turbine is similar to a piston ring, complete with end gap. It is not a positive seal, but more like a barrier which depends on some backpressure to prevent oil from leaking past. The oil side of the seal is at crankcase pressure,

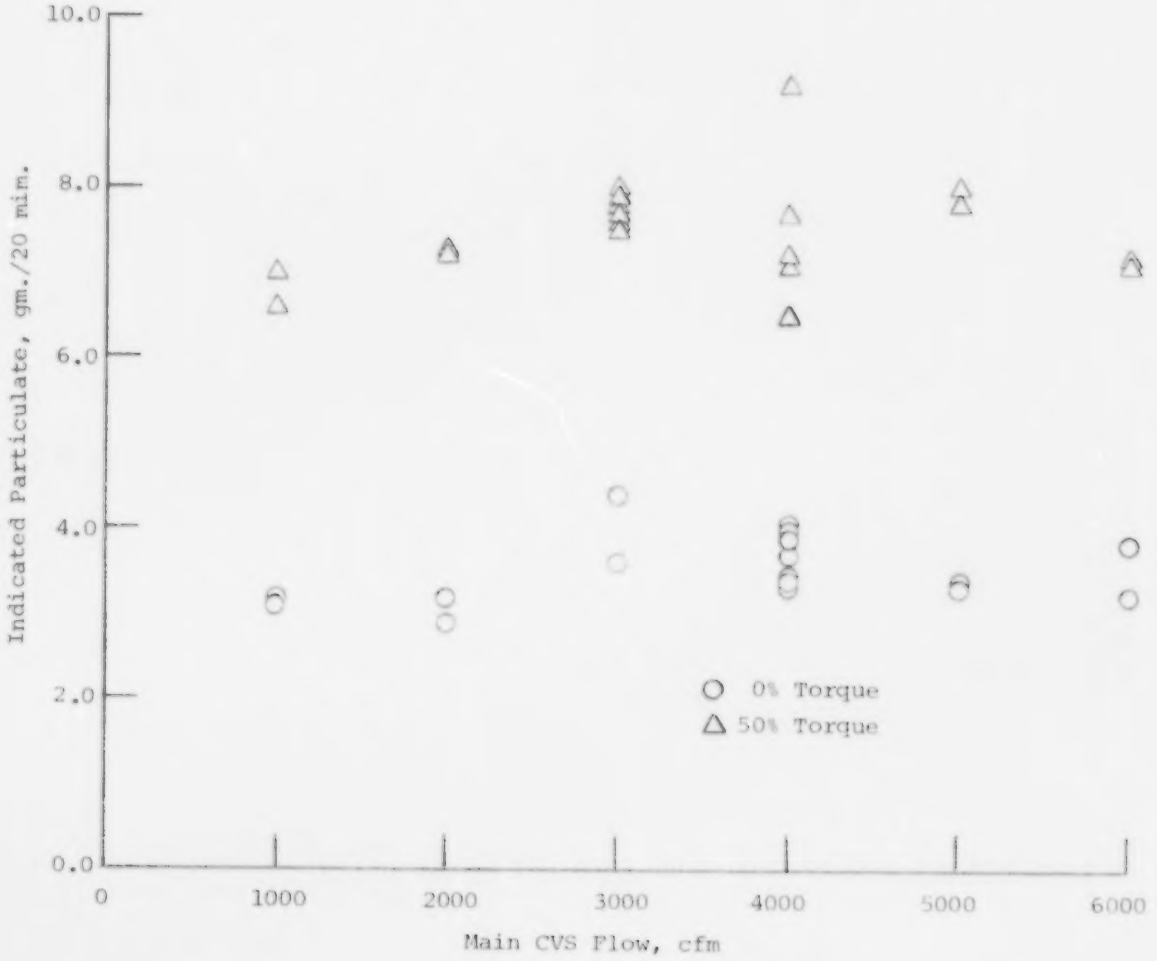

Figure 8. Indicated particulate vs. main CVS flow.

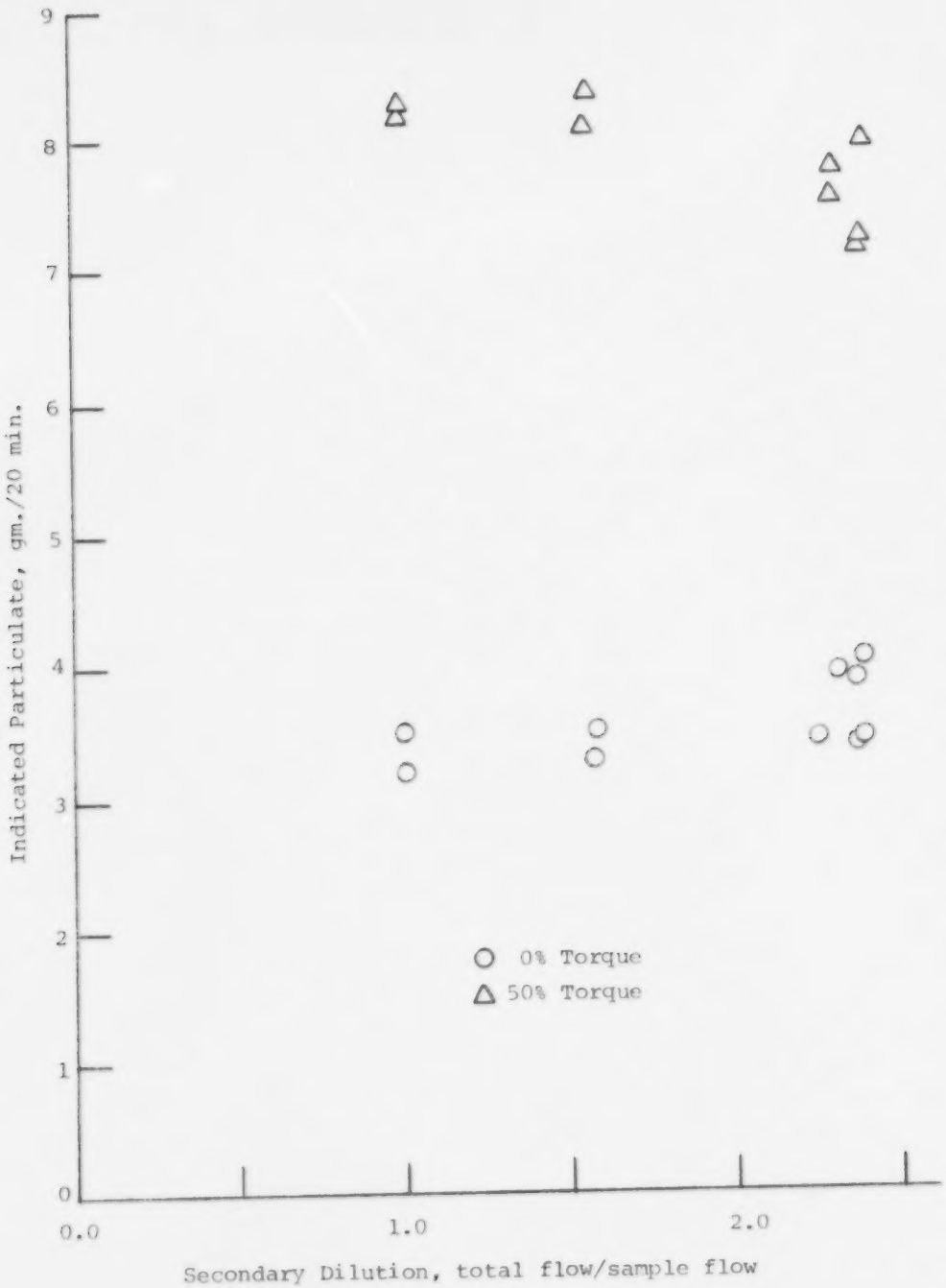

Figure 9. Indicated particulates vs. secondary dilution.

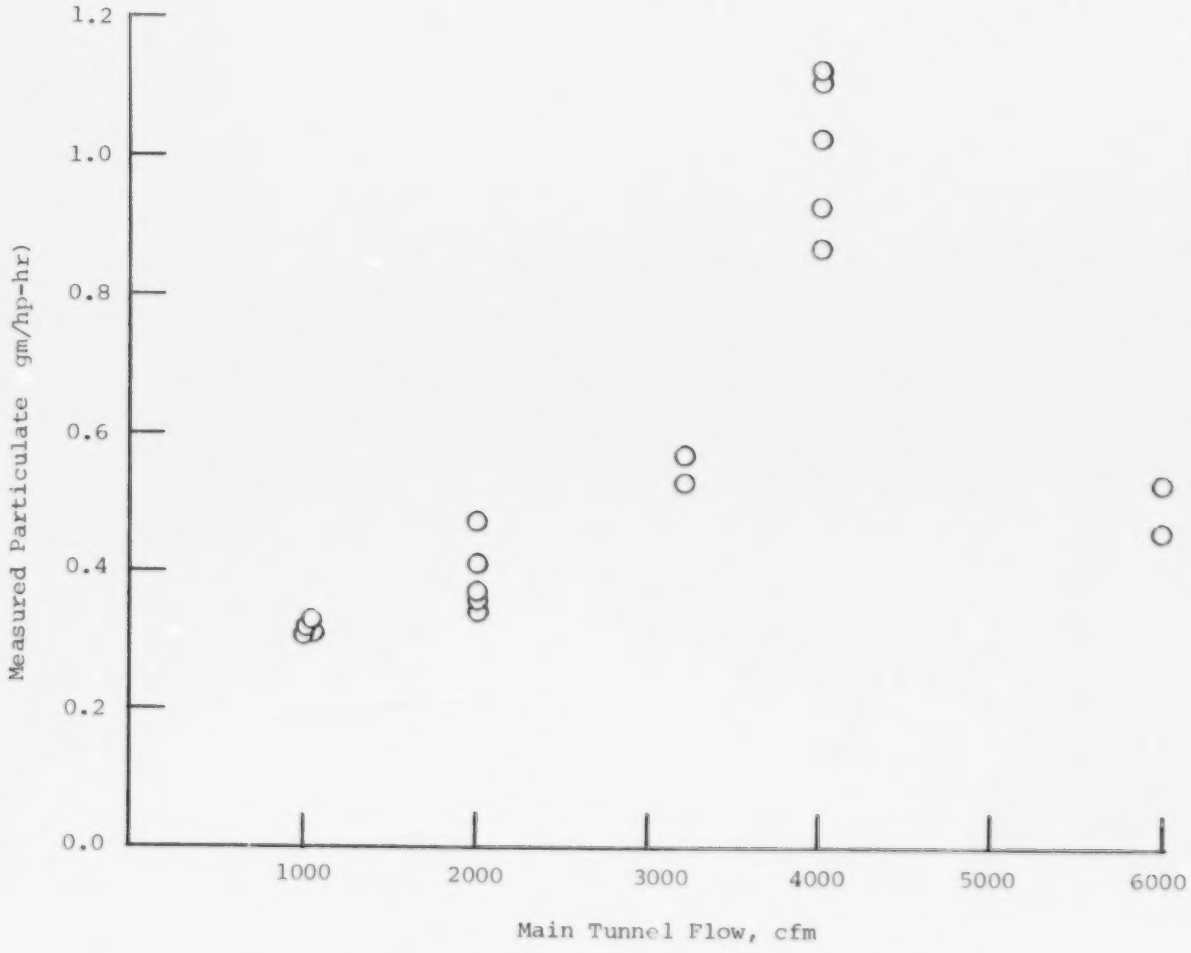

Figure 10. Measured particulate vs tunnel flow.

which would be slightly positive due to blow-by. Normally, even at idle, there would be a slight positive pressure at the turbine exit. However, when the exhaust pipe is connected to the CVS, a negative pressure can be transmitted up the pipe to the turbine oil seal, especially at idle. When the measured particulate was plotted versus tunnel vacuum (at idle), a correlation seemed obvious (Figure 11). An orifice plate was then removed from the tunnel to produce less tunnel vacuum at 4000 cfm. The measured particulate fell on the curve determined by the previous tests.

TABLE 5. SUMMARY OF SPECIAL PARTICULATE TESTS
1979 Cummins NTC-290

Test NO.	Bag HC	CO	CO_2	Int. NO_x	Fuel	Part.	Eff.	Pow.	cfm	"H_2O Tunnel Vac.
D18-3	0.30	2.10	601.	8.13	0.417	0.87	90	17.29	4000	16.2
D18-4	0.34	2.16	610.	9.02	0.423	0.93	89	61.52	4000	16.2
D18-5	0.32	2.21	616	8.49	0.427	0.41	95	16.87	2000	9.6
D18-6	0.40	2.23	622.	9.00	0.431	0.47	94	16.79	2000	9.6
D18-7	V O I D ----------									
D18-8	0.35	2.06	601.	9.18	0.416	0.53	94	17.04	6000	10.1
D18-9	0.33	2.18	572.	9.52	0.396	0.46	95	17.43	6000	9.7
D18-10	0.34	2.06	617.	8.93	0.427	0.57	93	17.89	3000	12.4
D18-11	0.36	2.07	606.	9.56	0.420	0.53	92	18.00	3000	12.4
D18-12	0.32	2.06	607.	8.14	0.420	0.32	97	18.17	1000	2.7
D18-13	0.32	2.13	595.	8.18	0.412	0.31	97	18.21	1000	2.7
D18-14	0.36	2.02	699.	8.58	0.484	1.13	84	17.64	4000	16.5
D18-15	0.32	1.81	570.	7.38	0.394	1.03	84	18.13	4000	16.5
D18-16	0.32	1.85	559.	7.64	0.387	1.11	85	18.31	4000	16.5
D18-17	0.35	2.13	606.	8.46	0.420	0.37	94	17.50	2000	4.5
D18-18	0.31	1.89	591.	8.10	0.409	0.36	93	17.97	2000	4.5
D18-19	0.34	1.86	570	7.63	0.395	0.34	93	18.29	2000	4.5
D18-20	0.31	2.21	627	9.13	0.435	0.31	96	17.46	1000	3.2
D18-21	0.30	1.80	621	8.31	0.430	0.33	96	17.46	1000	3.1
D18-22	0.36	2.17	617	8.09	0.428	0.39	88	17.47	4000	5.7
D18-23	0.32	2.14	630.	8.93	0.437	0.41	89	17.32	4000	5.6

It is likely that the transient test is especially sensitive to this phenomenon. The first ten minutes of the test contain a great amount of idle operation, during which leaking oil can accumulate in the turbine area. The LA freeway section would then burn or vaporize this accumulated oil. Steady-state idle tests would never heat up the exhaust system enough to fully vaporize this heavy oil, while high power modes would generate enough pressure on the bearing side of the turbine to prevent leaks. The foregoing results emphasize the need to keep the tunnel vacuum very low, especially with some turbocharged engines.

Engine 19, the International Harvester DTI-466B, previously tested as Engine No. 7, was returned by EPA for correlation tests. In addition to a single baseline test at 1000 cfm, the Project Officer requested a series of

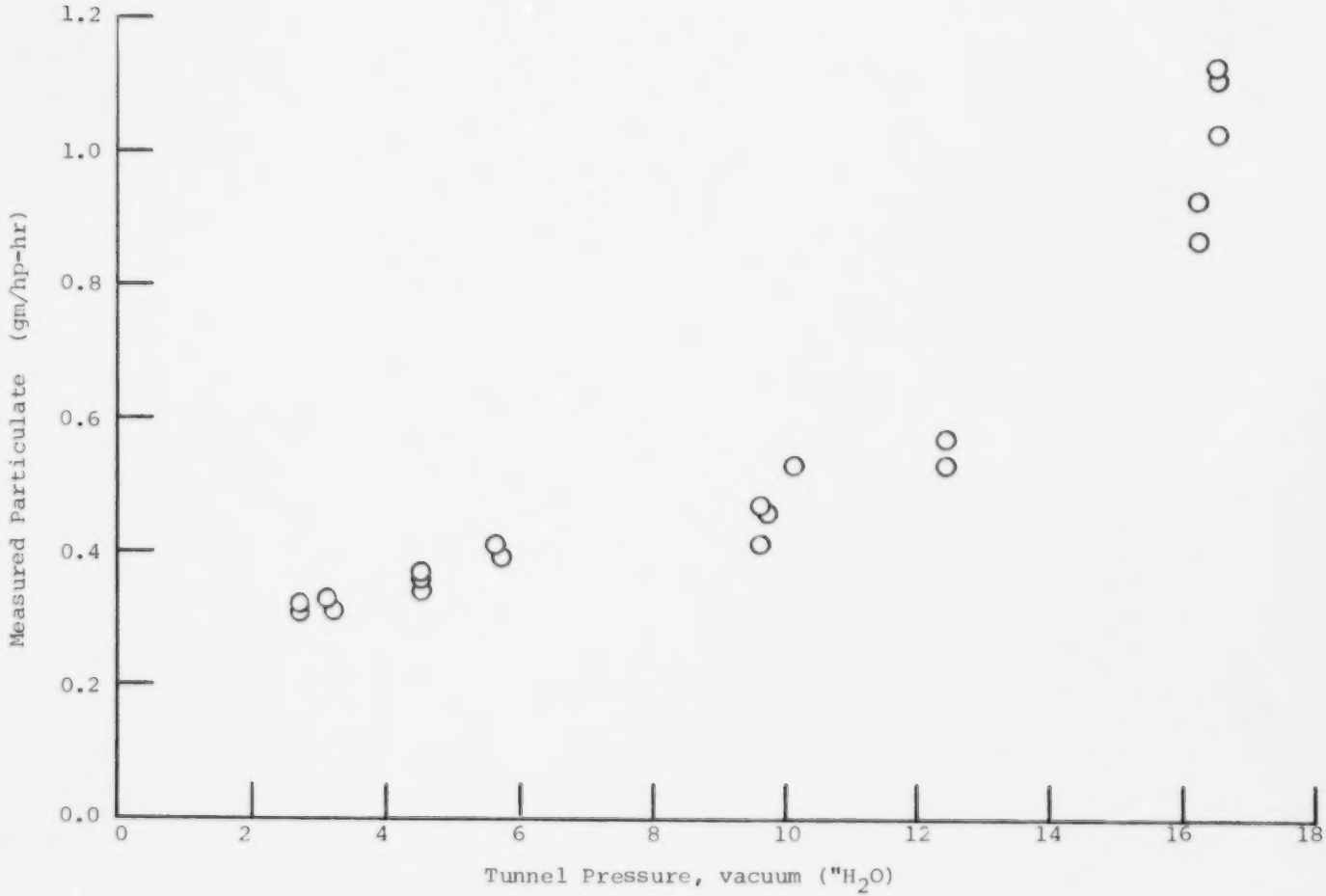

Figure 11. Measured particulate vs tunnel vacuum

additional tests at higher CVS dilution flows and with varying exhaust backpressure settings. The results are summarized in Table 6. These results show that there was some possible decrease in indicated HC with dilution flow. However, at such great dilution, the measured HC approaches the background HC, so that accuracy is not expected to be good. Other emissions showed no clear trends. A linear regression analysis of the particulate versus idle backpressure shows a possible increase with increasing vacuum, but the coefficient of determination (r^2) is only 0.3. Further tests would be necessary to determine whether the effect, although not as dramatic, has the same origin as with the Cummins engine (Number 18).

TABLE 6. IHC DTI-466B ADDITIONAL TEST SUMMARY

Test No.	HC	CO	CO_2	NO_x	Fuel	Part.	Eff.	Hp-Hr	cfm	Idle B.P. "H_2O	Rated B.P. "Hg
D19-3C	0.84	2.16	659.	6.51	0.458	0.36	93	12.56	1000	-3.0	1.9
D19-3H	0.63	1.48	612	5.62	0.424	0.31	97	12.63	1000	-3.0	1.9
D19-3H2	0.62	1.57	651	6.57	0.451	0.35	97	12.51	1000	-2.0	3.0
D19-3H3	0.61	1.57	685	6.58	0.475	0.32	97	12.42	1000	-3.0	1.8
D19-4C	0.64	2.15	635	6.34	0.441	0.36	95	12.55	3000	-13.5	1.9
D19-4H	0.34	1.60	657	7.11	0.454	0.41	93	12.20	3000	-13.5	1.9
D19-4H2	0.31	1.57	655	Void	0.453	0.39	88	11.98	3000	-10.0	3.3
D19-4H3	0.44	1.56	627	6.13	0.434	0.48	88	12.49	3000	-14.5	-5.5*
D19-4H4	20.7	1.62	666	6.39	0.460	0.44	94	12.03	3000	-18.0	-7.5*
D19-4H5	0.34	1.64	649	6.19	0.449	0.40	93	11.84	3000	-3.0	3.0
D19-4H6	0.36	1.68	659	6.99	0.455	0.23	90	11.84	3000	-3.0	1.9
D19-5C	0.66	2.19	688	6.29	0.477	0.43	90	11.86	5000	-7.8	1.9
D19-5H	0.34	1.59	623	5.95	0.431	0.38	92	12.12	5000	-7.8	1.9
D19-5H2	0.38	1.55	673	5.93	0.465	0.45	89	11.62	5000	-7.8	3.0
D19-5H3	0.48	1.58	637	6.01	0.441	0.35	91	12.01	5000	-15.0	-9.0*

Emissions in grams per horsepower-hours

*"H_2O

Due to persistent discrepancy between particulate rates achieved at SwRI and at Ann Arbor, the need for a correlation program arose. The Project Officer directed that the baseline program be suspended while this correlation program was carried out. The previously tested Caterpillar 3406 DITA engine was used.

The EPA secondary particulate tunnel was brought to SwRI for a series of side-by-side correlation tests on the SwRI main tunnel. Also installed in the tunnel was a 47 mm single dilution filter for reference purposes. Both steady-state and transient tests were run. Steady-state tests were run at several conditions, but the most frequent and repeatable was 1300 rpm at 600 lb-ft. Results for this condition are summarized in Table 7.

These tests show no significant differences among the three sampling systems under steady-state conditions.

TABLE 7. CATERPILLAR 3406 DITA, STEADY-STATE TEST SUMMARY
1300 RPM, 600 FT-LB, GRAMS/20 MINUTES

Date	(No.)	Particulate 90mm	Particulate 47 mm	Particulate 70 mm	Configuration
12/2/80	(1)	10.3	10.7	10.3	Standard
	(2)	10.9	10.8	10.7	Standard
12/3/80	(3)	9.8	10.2	10.7	Inlets Swapped
12/4/80	(6)	10.7	10.2	11.0	Inlets Swapped
	(7)	11.8	14.0	12.2	Inlets Swapped
12/5/80	(1)	11.0	11.7	10.2	5" inlet & screen
	(2)	11.2	11.1	11.4	5" inlet & screen
	(7)	12.7	12.1	11.4	Humidity & damper open
	(8)	11.1	11.5	11.4	Humidity & damper open
12/6/80	(6)	11.4	13.0	11.5	12:00 o'clock
	(7)	11.3	11.2	11.6	3:00
	(8)	11.3	11.5	11.8	6:00 90 mm position
	(9)	11.4	11.7	12.4	9:00
	(10)	11.2	11.5	12.0	12:00
12/16/80	(2)	10.7	10.1	10.1	Exhaust cut back 3"
	(3)	10.8	10.0	10.3	Exhaust cut back 3"
12/17/80	(1)	10.3	10.7	11.9	EPA fuel
	(2)	10.5	10.7	11.0	EPA fuel
12/30/80	(1)	10.9	9.8	9.3	In/out swapped
	Avg.	11.0	11.3	11.2	(excluding 12/30)
	Std. Dev.	±0.6	±1.0	±0.7	

In Table 8, results of all transient tests are summarized. Averages of results from all tests with each tunnel intact, i.e., with its own air handling system, show fairly consistent higher results from the EPA tunnel. The difference amounts to about 14 percent.

In tests D21-6-8, the inlet systems were swapped. The SwRI tunnel came up to the EPA tunnel average, but the EPA tunnel measurement was unchanged. In tests D21-29 & -30, the complete inlet and outlet air handling systems were interchanged between the two tunnels. This resulted in a flip-flop of results, with the SwRI tunnel producing the EPA average and vice-versa.

In Tests D21-31-33, the EPA 70 mm filter holders were installed at the outlet of the SwRI tunnel, the 90 mm filter support screen having been removed. No significant difference was observed. In Tests 34 through 37, attempts were made to increase the particulate by deliberately increasing the torque slope nine to fourteen percent. The particulate emissions

TABLE 8. CATERPILLAR 3406 DITA, TRANSIENT TEST SUMMARY

Test No.	HC	CO	CO_2	NO_x	Fuel	Particulate 90mm	Particulate 47mm	Particulate 70mm	Date	Power	Control Tape	
D21-1	0.27	4.58	630.	8.38	0.439	--	--	--	12/01	26.97	C	
-2	0.39	4.02	614.	7.93	0.427	0.63	0.61	0.67	12/02	27.26	"	
-3	0.36	4.09	612.	8.37	0.426	0.64	0.65	0.76	"	27.34	"	"Baseline"
-4	0.38	4.07	627.	8.79	0.437	0.64	0.67	0.63	12/03	27.79	"	No dilution Air
-5	0.39	4.01	619.	8.65	0.431	0.70	0.65	--	"	27.79	"	
-6	0.41	4.17	630.	8.55	0.439	0.70	0.71	0.71	"	27.63	"	Inlets swapped
-7	0.42	4.19	621.	8.46	0.433	0.70	0.66	0.71	12/04	27.59	"	
-8	0.41	4.34	653.	8.99	0.455	0.70	0.69	0.80	"	27.51	"	Results
-9	0.43	4.57	699.	9.77	0.486	0.75	0.75	0.90	"	27.41	"	Questionable
-9	--	3.88	625.	7.60	0.435	0.59	0.65	0.68	12/10	25.05	A	Original SwRI
-10	--	3.83	601.	7.39	0.418	0.59	0.62	0.58	"	24.93	"	Control Tape
-11	--	3.78	612.	7.49	0.425	0.58	0.62	0.66	"	26.29	B	Corrected Original
-12	--	3.63	606.	7.35	0.422	0.55	0.59	0.63	"	26.22	"	SwRI Tape
-13	--	3.86	589.	7.12	0.410	0.60	0.64	0.71	"	27.32	C	
-14	--	3.86	592.	7.16	0.411	0.59	0.65	0.68	"	27.51	"	Current Tape
-15	--	3.61	606.	7.47	0.421	0.56	0.59	0.62	"	25.10	A	
-16	--	3.54	597.	7.48	0.415	0.57	0.57	0.62	"	25.22	"	Original Tape
-17	--	4.49	599.	7.30	0.417	0.66	0.67	0.74	12/11	27.56	C	All remaining tests
-18	--	3.99	602.	7.34	0.419	0.60	0.63	0.68	"	27.64	"	use Current Tape
-19	--	4.19	617.	7.18*	0.429	0.63	0.68	0.78	12/17	28.18	"	
-20	0.33	4.21	637.	8.72	0.444	0.62	0.66	0.76	"	27.96	"	
-21	0.34	4.29	655.	8.49	0.456	0.70	0.72	0.88	"	28.09	"	Results
-22	0.37	4.51	694.	9.63	0.483	0.80	0.76	--	"	27.79	"	Questionable
-23	0.37	3.53	600.	7.59*	0.426	0.56	0.59	0.64	12/19	27.31	"	EPA Fuel
-24	0.34	3.48	602.	8.29*	0.427	0.62	0.60	0.68	"	27.32	"	"
-25	--	3.85	595.	8.41	0.414	0.62	0.61	0.73	12/22	28.01	"	"
-26	--	3.72	602.	8.24	0.419	0.65	0.60	0.67	"	27.93	"	"
-27	0.33	4.29	613.	7.92	0.427	0.67	0.65	0.81	12/23	26.66	"	
-28	0.29	4.35	611.	7.71	0.426	0.67	0.74	0.81	"	26.96	"	SwRI Fuel
-29	0.37	4.06	613.	8.33	0.427	0.70	0.61	0.60	12/30	27.59	"	
-30	0.34	4.03	620.	8.36	0.432	0.68	0.72?	0.60	"	27.66	"	90 & 70 mm air handling systems swapped
				Avg.		0.61	0.63	0.70	(standard configurations only)			
				Std. Dev.		±0.04	±0.04	±0.07				
-31	0.40	4.14	601.	7.97	0.419	--	0.64	0.64	1/5	27.88	C	
-32	0.31	4.10	609.	7.64	0.424	--	0.62	0.60	1/5	27.88	"	70 mm filters
-33	0.33	4.25	609.	8.27	0.424	--	0.66	0.67	1/6	27.78	"	in SwRI tunnel
-34	0.31	4.22	612.	7.96	0.426	0.67	0.64	0.75	1/7	28.41	"	
-35	0.34	4.21	610.	8.14	0.425	0.63	0.64	0.78	1/7	28.16	"	Runs at
-36	0.33	4.04	617.	8.08	0.429	0.62	0.64	0.77	1/7	30.27	"	increased torque
-37	0.24	4.04	626.	7.34*	0.427	0.68	0.64	0.79	1/8	30.25	"	
-38	0.29	4.18	626.	7.60	0.436	0.68	0.63	0.71	1/13	27.93	"	
-39	0.33	4.11	623.	7.78	0.434	0.64	0.62	0.71	1/13	27.86	"	Inlet and outlet
-40	0.32	4.24	624.	7.67	0.434	0.67	0.65	0.73	1/13	27.81	"	gas meters
-41	0.33	4.21	616.	7.81	0.429	0.64	0.66	0.71	1/13	27.84	"	swapped

*Bag NO_x

Emissions in g/hp-hr

Fuel in lb/hp-hr

Power in hp-hr

measured from the two secondary tunnels and from the single dilution system were not significantly affected. The final series of tests involved switching the inlet and outlet gas meters on each tunnel, and then reducing the sample flow on the EPA tunnel. Again, no significant changes were noted. At this point, the particulate correlation program was suspended and the baseline testing resumed. The Project Officer directed that no changes be made in the SwRI tunnel.

A series of steady-state particulate tests was requested by the Project Officer, to be run following baseline testing of the 1979 Cummins NH-250. These tests are summarized in Table 9.

TABLE 9. STEADY-STATE PARTICULATE
1979 Cummins NH-250

		g/hr	
RPM	Torque	90 mm	47 mm
1500	2%	15.8	13.4
		17.3	14.6
1500	25%	18.6	17.6
		20.7	19.3
1500	75%	32.9	30.1
		29.4	27.8
2100	100%	405.	372.
		366.	371.
2100	75%	88.9	88.9
		78.7	85.0
2100	25%	31.4	28.6
		34.0	31.5

90 mm filters are double dilution
47 mm filters are single dilution

LIST OF REFERENCES

1. Federal Register, "Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines: Particulate Regulation for Heavy-Duty Diesel Engines." Part III, Vol. 46, No. 4, January 7, 1981.

2. Federal Register, "1983 and Later Model Year HD Engines," Part II, Proposed Gaseous Emission Regulations, Vol. 44, No. 31, February 13, 1979.

3. Federal Register, "Gaseous Emission Regulations for 1984 and Later Model Year Heavy-Duty Engines," Part II, Vol. 45, No. 14, January 21, 1980.

4. Federal Register, "Heavy-Duty Engines for 1979 and Later Model Years," Part III, Certification and Test Procedures, Vol. 42, No. 174, September 8, 1977.

APPENDIX A

SUMMARIES OF THE BASELINE RESULTS

Table Number	Engine Number	Description
		Summary of the Results
A-1	D-1	1978 Cat. 3208 DINA
A-2	D-2	1976 Cummins NTC-350
A-3	D-3	1978 DDA 6V92T
A-4	D-4	1979 Cummins NTCC-350
A-5	D-5	1978 DDA 8V-71N
A-6	D-6	1979 DDA 6V92TA
A-7	D-7	1979 IH DTI-466B
A-8	D-9	1979 Mack ETAZ
A-9	D-10	1980 Mack ETSX
A-10	D-11	1979 Cummins VTB-903
A-11	D-12	1979 Cat. 3406 DITA
A-12	D-13	1979 Cat. 3406 PCTA
A-13	D-14	1979 Cummins B.C. NTC-350
A-14	D-15	1979 IH DT-466
A-15	D-16	1979 DDA 6V-92TA (90 mm)
A-16	D-17	1979 DDA 8V-71TA
A-17	D-18	1979 Cummins NTC-290
A-18	D-19	1979 IH DTI-466B
A-19	D-22	1979 Cummins NH-250

TABLE A-1. DIESEL ENGINE 1 SUMMARY OF RESULTS
1978 Caterpillar 3208

ENGINE DESCRIPTION

Engine: 1978 Caterpillar 3208 No. 1A6791
Carburetor: --
Distributor: --
Rated Power: 212 @ 2800
Maximum Torque: 503 @ 1400
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	503 @ 1400	462 @ 1700
Max. Engine Power, HP @ RPM	212 @ 2800	188 @ 2700
Cylinder Compression, psi min.-max. (avg.)		
Idle RPM		650
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	417	2100	429	3100		4100	
-		1200	425	2200	420	3200		4200	
-		1300	433	2300	411	3300		4300	
400		1400	442	2400	401	3400		4400	
500		1500	450	2500	390	3500		4500	
600	377	1600	458	2600	379	3600		4600	
700	385	1700	462	2700	366	3700		4700	
800	393	1800	454	2800	352	3800		4800	
900	401	1900	445	2900	0	3900		4900	
1000	409	2000	437	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-1 (Cont'd). DIESEL ENGINE 1 SUMMARY OF RESULTS
1978 Caterpillar 3208

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D1-5	Speed	Torque	Power	Speed	Torque	Power
Standard Error	29.	5.%	6.%	36.	4.%	5.%
Slope	.989	.934	.954	.990	.959	.971
Corr. Coef.	.9989	.9708	.9772	.9983	.9743	.9761
Intercept	31.	6.7	.9	26.	5.0	.4
Points Used	1162	980	980	1162	988	988
kW-hr Dev.[c]	----------	-8.8	----------	----------	-6.2	
TEST D1-6						
Standard Error	24.	6.%	8.%	26.	6.%	6.%
Slope	.991	.929	.967	.992	.962	.975
Corr. Coef.	.9993	.9514	.9645	.9991	.9573	.9620
Intercept	21.	15.4	1.9	14.	6.0	.2
Points Used	1162	987	987	1162	989	989
kW-hr Dev.[c]	----------	-3.4	----------	----------	-5.6	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D1-5	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	9.48	13.60	16.17	6.33	6.23	9.98	14.72	6.84
CO, gram	16.55	16.49	19.38	7.22	8.16	9.77	17.74	7.06
CO_2, gram	1245.0	1550.7	3959.7	970.0	1048.6	1400.0	3924.7	965.1
NOX, gram	12.41	13.90	35.59	11.04	11.71	13.12	36.74	11.21
FUEL, kg	0.410	0.511	1.274	0.316	0.314	0.456	1.261	0.315
KW-HR	1.05	1.49	5.01	1.03	1.10	1.53	5.14	1.07
TEST D1-6								
HC, gram	9.99	13.10	16.73	6.44	5.85	10.46	15.74	6.86
CO, gram	15.03	18.00	20.70	5.76	8.42	10.34	18.00	6.89
CO_2, gram	1269.4	1562.9	3913.4	771.0	1018.6	1440.5	3951.7	971.9
NOX, gram	10.92	12.29	33.74	10.33	10.70	12.20	34.53	9.93
FUEL, kg	0.418	0.515	1.261	0.252	0.351	0.470	1.270	0.317
KW-HR	1.09	1.61	5.21	1.19	1.10	1.49	5.19	1.10

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D1-5 = 736 mm Hg Test D1-6 = 748 mm Hg.

TABLE A-1 (Cont'd). Diesel Engine 1 Summary of Results
1978 Caterpillar 3208

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D1-7	Speed	Torque	Power	Speed	Torque	Power
Standard Error	28.	5.%	6.%	30.	5.%	6.%
Slope	.992	.959	.978	.992	.976	.976
Corr. Coef.	.9990	.9640	.9723	.9988	.9650	.9679
Intercept	.12	7.7	.8	10.	2.0	.0
Points Used	1162	981	981	1162	976	976
kW-hr Dev.[c]	----------	-4.0	----------	----------	-4.5	----------
TEST D1-8						
Standard Error	26.	4.%	5.%	75.	5.%	5.%
Slope	.990	.990	.992	.990	.994	.997
Corr. Coef.	.9991	.9762	.9788	.9928	.9668	.9696
Intercept	15.	1.9	.2	15.	-.1	-.6
Points Used	1162	978	978	1162	980	980
kW-hr Dev.[c]	----------	-3.4	----------	----------	-3.4	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D1-7	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	9.44	13.48	15.28	6.29	6.61	10.37	15.20	6.84
CO, gram	18.93	19.01	19.65	7.39	8.42	10.04	17.09	6.78
CO_2, gram	1259.5	1580.5	3963.6	963.2	984.1	1350.6	3786.3	995.1
NOX, gram	12.05	13.49	38.27	10.56	10.53	12.03	37.55	11.06
FUEL, kg	0.416	0.521	1.275	0.314	0.321	0.441	1.217	0.324
KW-HR	1.10	1.60	5.21	1.14	1.21	1.51	5.19	1.09
TEST D1-8								
HC, gram	8.46	12.63	14.35	6.49	5.95	9.30	14.14	6.70
CO, gram	17.52	17.70	18.36	6.77	7.97	9.39	18.38	6.85
CO_2, gram	1237.4	1543.9	3882.4	963.3	1001.2	1328.9	4288.7	1020.0
NOX, gram	11.85	12.89	35.88	10.80	10.40	11.68	38.13	10.80
FUEL, kg	0.407	0.508	1.247	0.314	0.326	0.433	1.375	0.332
KW-HR	1.16	1.58	5.24	1.12	1.17	1.56	5.22	1.14

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D1-7 = 740 mm Hg Test D1-8 = 743 mm Hg.

TABLE A-1 (Cont'd). DIESEL ENGINE 1 SUMMARY OF RESULTS
1978 Caterpillar 3208

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D1-11	Speed	Torque	Power	Speed	Torque	Power
Standard Error	29.	5.%	6.%	26.	5.%	6.%
Slope	.996	.966	.981	.999	.972	.983
Corr. Coef.	.9989	.9676	.9735	.9991	.9650	.9735
Intercept	14.	4.4	.4	5.	4.0	.6
Points Used	1162	979	979	1162	984	984
kW-hr Dev.[c]	----------	-5.1	----------	----------	-4.5	----------
TEST D1-13						
Standard Error	29.	5.%	6.%	27.	5.%	5.%
Slope	.995	.974	.972	.998	.981	.976
Corr. Coef.	.9989	.9706	.9738	.9991	.9729	.9762
Intercept	-12.	3.9	.5	-15.	2.0	.1
Points Used	1162	977	977	1162	975	975
kW-hr Dev.[c]	----------	-2.9	----------	----------	-3.3	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D1-11	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	9.41	13.99	18.14	7.34	6.59	11.28	17.66	7.17
CO, gram	18.77	18.93	19.80	7.43	7.71	10.38	18.34	6.79
CO_2, gram	1160.2	1450.3	3721.1	943.3	1041.8	1464.4	4043.6	996.7
NOX, gram	10.71	12.05	34.24	9.48	10.55	14.85	34.39	10.41
FUEL, kg	0.384	0.481	1.201	0.308	0.339	0.478	1.301	0.325
KW-HR	1.14	1.53	5.22	1.05	1.10	1.54	5.24	1.10
TEST D1-13								
HC, gram	9.73	14.42	17.46	7.31	9.24	10.73	16.40	6.85
CO, gram	18.54	18.30	18.72	6.97	8.40	10.14	18.29	6.52
CO_2, gram	1254.6	1587.5	4005.8	969.7	1055.5	1417.2	3995.5	998.1
NOX, gram	11.53	13.01	39.31	8.27	10.82	12.15	38.35	10.47
FUEL, kg	0.414	0.524	1.290	0.316	0.346	0.463	1.285	0.325
KW-HR	1.21	1.63	5.19	1.12	1.21	1.58	5.17	1.16

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D1-11= 750 mm Hg Test D1-13= 744 mm Hg.

TABLE A-1 (Cont'd). DIESEL ENGINE 1 SUMMARY OF RESULTS
1978 Caterpillar 3208

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D1-14	Speed	Torque	Power	Speed	Torque	Power
Standard Error	27.	5.%	6.%	25.	5.%	5.%
Slope	.997	.972	.986	.997	.979	.991
Corr. Coef.	.9991	.9698	.9748	.9992	.9701	.9752
Intercept	17.	4.3	.7	17.	2.1	.0
Points Used	1162	978	978	1162	977	977
kW-hr Dev.[c]	----------	-4.5----------		----------	-4.5	----------
TEST						
Standard Error						
Slope						
Corr. Coef.						
Intercept						
Points Used						
kW-hr Dev.[c]						

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D1-14	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	9.15	13.70	17.01	7.13	6.02	10.71	16.61	7.19
CO, gram	17.73	17.42	18.92	6.66	7.88	10.31	18.45	6.95
CO_2, gram	1266.3	1616.7	3913.2	897.7	1026.2	1424.9	4010.3	992.0
NOX, gram	11.69	13.15	35.54	9.17	10.06	11.78	36.26	9.39
FUEL, kg	0.417	0.532	1.260	0.293	0.333	0.465	1.290	0.323
KW-HR	1.07	1.61	5.21	1.10	1.14	1.54	5.22	1.09
TEST								
HC, gram								
CO, gram								
CO_2, gram								
NOX, gram								
FUEL, kg								
KW-HR								

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D1-14 = 741 mm Hg Test = mm Hg.

TABLE A-1 (Cont'd). DIESEL ENGINE 1 SUMMARY OF RESULTS
1978 Caterpillar 3208

DIESEL TRANSIENT CYCLE

	Test D1-5			Test D1-6			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	5.31	4.28	4.43	5.08	4.38	4.48	4.53
CO, g/kW-hr	6.94	4.84	5.14	6.54	4.91	5.14	5.09
CO_2, g/kW-hr	899.	831.	841.	826.	838.	836.	830.
NOX, g/kW-hr	8.49	8.24	8.28	7.39	7.58	7.55	7.83
SFC, kg/kW-hr	0.292	0.269	0.272	0.269	0.271	0.271	0.269
WORK, kW-hr	8.59	8.83	8.80	9.10	8.89	8.92	8.99
POWER, kW	25.77	26.49	26.39	27.30	26.67	26.76	26.96
Particulate, g/kW-hr	1.19	0.98	1.01	1.00	1.00	1.00	1.06
Filter Eff. %	91.9	83.5	84.7	73.0	78.0	77.3	78.8

13-MODE

	Test 1-1	Test 1-2	Average
HC, g/kW-hr	2.285	2.271	2.278
CO, g/kW-hr	4.701	4.435	4.568
NOX, g/kW-hr	5.576	5.227	5.401
SFC, kg/kW-hr	0.257	0.263	0.260
POWER, kW	54.5	53.0	53.8

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	4.53 (3.38)	HC	16.84	3.95
CO,	g/kW-hr (g/hp-hr)	5.09 (3.80)	CO	18.92	4.44
NOX,	g/kW-hr (g/hp-hr)	7.83 (5.84)	NOX	29.11	6.83
Particulate,	g/kW-hr (g/hp-hr)	1.06 (0.79)	Particulate	3.94	0.93
SFC,	kg/kW-hr (lb/hp-hr)	0.269 (0.442)	FUEL CONS.	--	235.
WORK,	kW-hr (hp-hr)	8.99 (12.06)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-1 (Cont'd). DIESEL ENGINE 1 SUMMARY OF RESULTS
1978 Caterpillar 3208

DIESEL TRANSIENT CYCLE

	Test D1-7			Test D1-8		
	Cold	Hot	Composite	Cold	Hot	Composite
HC, g/kW-hr	4.92	4.34	4.42	4.61	3.97	4.06
CO, g/kW-hr	7.18	4.71	5.06	6.63	4.68	4.96
CO_2, g/kW-hr	859.	791.	801.	838.	840.	840.
NOX, g/kW-hr	8.22	7.92	7.96	7.85	7.81	7.82
SFC, kg/kW-hr	0.279	0.256	0.259	0.272	0.271	0.271
WORK, kW-hr	9.05	8.99	9.00	9.10	9.10	9.10
POWER, kW	27.15	26.97	27.00	27.30	27.30	27.30
Particulate, g/kW-hr	1.09	1.04	1.07	--	0.88	--
Filter Eff. %	76.5	75.8	76.2	--	83.8	--

	Test D1-11			Test D1-13		
	Cold	Hot	Composite	Cold	Hot	Composite
HC, g/kW-hr	5.47	4.75	4.85	5.35	4.74	4.83
CO, g/kW-hr	7.26	4.81	5.16	6.83	4.76	5.06
CO_2, g/kW-hr	814.	839.	835.	854.	819.	824.
NOX, g/kW-hr	7.44	7.81	7.76	7.88	7.88	7.88
SFC, kg/kW-hr	0.266	0.272	0.271	0.278	0.265	0.267
WORK, kW-hr	8.94	8.99	8.98	9.15	9.12	9.12
POWER, kW	26.82	26.97	26.95	27.45	27.36	27.37
Particulate, g/kW-hr	1.16	1.11	1.12	1.00	1.07	1.06
Filter Eff. %	69.4	77.9	76.7	69.5	79.4	78.0

	Test D1-14		
	Cold	Hot	Composite
HC, g/kW-hr	5.23	4.51	4.61
CO, g/kW-hr	6.75	4.85	5.12
CO_2, g/kW-hr	856.	829.	833.
NOX, g/kW-hr	7.73	7.50	7.53
SFC, kg/kW-hr	0.278	0.268	0.269
WORK, kW-hr	8.99	8.99	8.99
POWER, kW	26.97	26.97	26.97
Particulate, g/kW-hr	1.13	1.11	1.11
Filter Eff.	75.5	80.4	79.7

TABLE A-2. DIESEL ENGINE 2 SUMMARY OF RESULTS
1976 Cummins NTC 350
Transient Mapping

ENGINE DESCRIPTION

Engine: 1976 Cummins NTC 350 No. 10501084
Carburetor: --
Distributor: --
Rated Power: 350 @ 2100
Maximum Torque:
Comments: Transient Mapping

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM		1038 @ 1500
Max. Engine Power, HP @ RPM	350 @ 2100	353 @ 2000
Cylinder Compression, psi min.-max. (avg.)		
Idle RPM	600	600

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	656	2100	872	3100		4100	
-		1200	714	2200	762	3200		4200	
-		1300	900	2300	256	3300		4300	
400		1400	1037	2400	0	3400		4400	
500		1500	1038	2500		3500		4500	
600	240	1600	1032	2600		3600		4600	
700	578	1700	1008	2700		3700		4700	
800	583	1800	982	2800		3800		4800	
900	574	1900	960	2900		3900		4900	
1000	608	2000	927	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-2 (Cont'd). DIESEL ENGINE 2 SUMMARY OF RESULTS
1976 Cummins NTC 350
Transient Mapping

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D2-12	Speed	Torque	Power	Speed	Torque	Power
Standard Error	19.	4.%	3.%	19.	4.%	2.%
Slope	.991	.973	.991	.989	.975	.992
Corr. Coef.	.9990	.9797	.9842	.9990	.9808	.9858
Intercept	33.	-5.0	-.7	33.	-7.2	-1.5
Points Used	1176	976	976	1176	961	961
kW-hr Dev.[c]		-6.3			-8.3	
TEST D2-13						
Standard Error	20.	5.%	6.%	20.	4.%	4.%
Slope	.988	.966	.991	.987	.985	1.004
Corr. Coef.	.9989	.9635	.9693	.9989	.9787	.9833
Intercept	35.	4.3	1.0	33.	2.5	.4
Points Used	1176	964	964	1176	962	962
kW-hr Dev.[c]		-6.6			-6.6	

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D2-12	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	5.01	6.44	8.28	2.43	2.46	4.23	4.96	2.61
CO, gram	22.10	37.67	32.13	18.91	21.58	31.63	28.24	18.94
CO_2, gram	2071.3	3134.6	7433.0	1731.6	1769.1	2819.0	7348.0	1676.2
NOX, gram	15.80	26.55	93.55	16.50	15.60	27.60	79.90	16.44
FUEL, kg	0.669	1.013	2.367	0.558	0.571	0.909	2.335	0.540
KW-HR	1.68	3.12	9.69	1.67	1.65	2.98	9.57	1.61
TEST D2-13								
HC, gram	5.46	6.45	7.68	1.99	2.37	3.95	4.73	2.18
CO, gram	26.30	40.32	34.89	19.87	23.54	33.58	31.94	19.38
CO_2, gram	2137.5	3127.5	7501.1	1720.3	1823.9	2953.8	7536.8	1748.0
NOX, gram	20.07	30.80	115.28	20.55	20.73	37.02	125.47	21.86
FUEL, kg	0.692	1.012	2.390	0.554	0.589	0.952	2.396	0.563
KW-HR	1.67	3.02	9.73	1.70	1.70	3.02	9.69	1.70

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D2-12 = 738 mm Hg Test D2-13 = 742 mm Hg.

TABLE A-2 (Cont'd). DIESEL ENGINE 2 SUMMARY OF RESULTS
1976 Cummins NTC 350
Transient Mapping

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D2-15	Speed	Torque	Power	Speed	Torque	Power
Standard Error	20.	4.%	5.%	18.	3.%	3.%
Slope	.988	.965	.981	.997	.987	1.029
Corr. Coef.	.9989	.9735	.9772	.9993	.9624	.9721
Intercept	27.	3.8	1.0	12.	4.3	.0
Points Used	1176	955	955	1176	1044	1044
kW-hr Dev.[c]	----------	-8.7	----------	----------	-8.3	----------
TEST D2-16						
Standard Error	21.	5.%	5.%	17.	3.%	3.%
Slope	.987	.955	.971	.998	.932	.965
Corr. Coef.	.9989	.9675	.9739	.9994	.9558	.9643
Intercept	28.	-1.4	.0	11.	-.7	-.1
Points Used	1176	973	973	1176	1050	1050
kW-hr Dev.[c]	----------	-8.7	----------	----------	-8.5	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D2-15	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	4.71	6.73	7.67	2.34	2.08	3.82	4.56	2.18
CO, gram	25.36	41.21	35.06	20.24	23.94	33.69	30.48	18.75
CO_2, gram	2169.3	3075.1	7548.1	1728.3	1797.8	2976.4	7440.9	1731.1
NOX, gram	21.00	33.11	117.76	20.64	20.04	37.02	118.17	21.52
FUEL, kg	0.701	0.997	2.405	0.557	5.581	0.959	2.365	0.557
KW-HR	1.61	2.98	9.50	1.67	1.72	2.98	9.47	1.65
TEST D2-16								
HC, gram	5.22	7.05	8.44	2.61	2.04	3.87	4.59	2.21
CO, gram	24.96	40.15	33.39	19.30	22.26	32.28	28.86	18.49
CO_2, gram	2119.4	3131.8	7411.0	1717.3	1765.0	2899.7	7447.1	1708.5
NOX, gram	19.22	31.55	106.99	20.02	18.94	34.90	111.68	20.55
FUEL, kg	0.686	1.014	2.361	0.554	0.569	0.934	2.367	0.550
KW-HR	1.58	2.98	9.52	1.67	1.72	2.96	9.47	1.63

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D2-15= 739 mm Hg Test D2-16= 739 mm Hg.

TABLE A-2 (Cont'd). DIESEL ENGINE 2 SUMMARY OF RESULTS
1976 Cummins NTC 350
Transient Mapping

DIESEL TRANSIENT CYCLE

	Test D2-12			Test D2-13			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.37						
CO, g/kW-hr	6.86						
CO_2, g/kW-hr	889.						
NOX, g/kW-hr	9.43						
SFC, kg/kW-hr	0.285						
WORK, kW-hr	16.16						
POWER, kW	48.48						
Particulate, g/kW-hr	0.89						
Filter Eff. %	97.9						

13-MODE

	Test 2-4	Test 2-6	Average
HC, g/kW-hr	0.333	0.315	0.324
CO, g/kW-hr	2.983	2.897	2.940
NOX, g/kW-hr	12.627	12.461	12.544
SFC, kg/kW-hr	0.261	0.260	0.261
POWER, kW	98.1	98.1	98.1

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

HC,	g/kW-hr (g/hp-hr)	0.91	(0.68)
CO,	g/kW-hr (g/hp-hr)	6.69	(4.99)
NOX,	g/kW-hr (g/hp-hr)	11.41	(8.51)
Particulate,	g/kW-hr (g/hp-hr)	0.81	(0.60)
SFC,	kg/kW-hr(lb/hp-hr)	0.281	(0.462)
WORK,	kW-hr (hp-hr)	15.89	(21.31)

	g/kg Fuel	g/km[a]
HC	3.24	1.40
CO	23.81	10.32
NOX	40.61	17.60
Particulate	2.88	1.25
FUEL CONS.		434.

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-2 (Cont'd). DIESEL ENGINE 2 SUMMARY OF RESULTS
1976 Cummins NTC 350
Transient Mapping

DIESEL TRANSIENT CYCLE

	Test D2-15			Test D2-16		
	Cold	Hot	Composite	Cold	Hot	Composite
HC, g/kW-hr	1.36	0.80	0.88	1.48	0.81	0.91
CO, g/kW-hr	7.73	6.76	6.90	7.48	6.46	6.61
CO_2, g/kW-hr	921.	882.	888.	913.	876.	881.
NOX, g/kW-hr	12.22	12.44	12.41	11.29	11.79	11.72
SFC, kg/kW-hr	0.296	0.282	0.284	0.293	0.280	0.282
WORK, kW-hr	15.76	15.81	15.80	15.74	15.78	15.77
POWER, kW	47.28	47.43	47.41	47.22	47.34	47.32
Particulate, g/kW-hr	1.00	0.83	0.85	1.05	0.77	0.81
Filter Eff. %	96.2	97.2	97.1	97.9	97.3	97.4

TABLE A-3. DIESEL ENGINE 3 SUMMARY OF RESULTS
1978 Detroit Diesel 6V92T

ENGINE DESCRIPTION

Engine: 1978 Detroit Diesel 6V92T
Carburetor: --
Distributor:--
Rated Power:
Maximum Torque:
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM		906 @ 1300
Max. Engine Power, HP @ RPM		316 @ 2100
Cylinder Compression, psi min.-max. (avg.)		
Idle RPM		550
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	854	2100	790	3100		4100	
-		1200	888	2200	0	3200		4200	
-		1300	906	2300		3300		4300	
400		1400	903	2400		3400		4400	
500	651	1500	898	2500		3500		4500	
600	684	1600	890	2600		3600		4600	
700	718	1700	878	2700		3700		4700	
800	752	1800	861	2800		3800		4800	
900	786	1900	840	2900		3900		4900	
1000	820	2000	818	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-3 (Cont'd). DIESEL ENGINE 3 SUMMARY OF RESULTS
1978 Detroit Diesel 6V92T

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D3-4	Speed	Torque	Power	Speed	Torque	Power
Standard Error	19.	5.%	5.%	17.	3.%	3.%
Slope	.991	.973	.995	.992	.955	1.000
Corr. Coef.	.9991	.9668	.9739	.9994	.9642	.9726
Intercept	25.	2.7	1.1	20.	1.2	-.3
Points Used	1176	912	912	1176	1054	1054
kW-hr Dev.[c]	----------	-10.1	----------	----------	-9.7	----------
TEST D3-5						
Standard Error	23.	6.%	5.%	18.	3.%	2.%
Slope	.991	.953	.979	.991	.930	.972
Corr. Coef.	.9987	.9563	.9641	.9993	.9659	.9733
Intercept	23	1.8	.5	20.	1.9	-.3
Points Used	1176	918	918	1176	1051	1051
kW-hr Dev.[c]	----------	-10.5	----------	----------	-10.8	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D3-4	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	1.97	3.32	6.10	2.35	2.35	3.37	6.30	2.44
CO, gram	8.89	10.22	15.74	16.90	15.93	12.31	14.96	17.48
CO_2, gram	1811.8	2387.6	6019.2	1542.8	1247.0	2271.6	6029.8	1577.3
NOX, gram	17.14	21.70	68.75	17.36	13.69	22.24	68.34	17.39
FUEL, kg	0.578	0.761	1.911	0.497	0.403	0.726	1.915	0.508
KW-HR	1.63	2.38	7.87	1.63	1.70	2.44	7.82	1.61
TEST D3-5								
HC, gram	2.06	3.57	6.41	2.52	2.15	3.15	5.87	2.29
CO, gram	8.69	10.24	15.13	16.62	14.33	10.44	14.33	16.08
CO_2, gram	2016.2	2529.9	6281.1	1663.1	1534.9	2104.9	5963.6	1577.2
NOX, gram	17.37	20.20	68.64	18.04	15.57	19.60	67.01	16.71
FUEL, kg	0.642	0.806	1.994	0.535	0.493	0.672	1.893	0.507
KW-HR	1.60	2.40	7.82	1.63	1.61	2.37	7.80	1.63

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D3-4 = 735 mm Hg Test D3-5 = 734 mm Hg.

TABLE A-3 (Cont'd). DIESEL ENGINE 3 SUMMARY OF RESULTS
1978 Detroit Diesel 6V92T

DIESEL TRANSIENT CYCLE

	Test D3-4			Test D3-5			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.02	1.07	1.06	1.08	1.00	1.01	1.04
CO, g/kW-hr	3.83	4.47	4.38	3.77	4.11	4.06	4.22
CO_2, g/kW-hr	870.	820.	827.	929.	834.	848.	838.
NOX, g/kW-hr	9.25	8.97	9.01	9.24	8.87	8.92	8.97
SFC, kg/kW-hr	0.277	0.262	0.264	0.296	0.266	0.270	0.267
WORK, kW-hr	13.52	13.57	13.56	13.45	13.41	13.42	13.49
POWER, kW	40.56	40.71	40.69	40.35	40.23	40.25	40.47
Particulate, g/kW-hr	0.88	0.71	0.73	0.72	0.71	0.71	0.72
Filter Eff. %	96.6	96.8	96.8	95.7	97.7	97.4	97.1

13-MODE

	Test D3-1	Test D3-2	Average
HC, g/kW-hr	0.784	0.719	0.752
CO, g/kW-hr	3.426	3.388	3.407
CO_2, g/kW-hr			
NOX, g/kW-hr	12.001	11.072	11.537
SFC, kg/kW-hr	0.264	0.262	0.263
POWER, kW	79.0	82.3	80.7

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %		NA	
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	1.04	(0.78)	HC 3.90	1.36
CO,	g/kW-hr	(g/hp-hr)	4.22	(3.15)	CO 15.81	5.53
NOX,	g/kW-hr	(g/hp-hr)	9.55	(7.12)	NOX 35.77	12.51
Particulate,	g/kW-hr	(g/hp-hr)	0.72	(0.54)	Particulate 2.70	0.94
SFC,	kg/kW-hr	(lb/hp-hr)	0.267	(0.439)	FUEL CONS. --	350.
WORK,	kW-hr	(hp-hr)	13.49	(18.09)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-4. DIESEL ENGINE 4 SUMMARY OF RESULTS
1979 Cummins NTCC-350

ENGINE DESCRIPTION

Engine: 1979 Cummins NTCC-350 #10677685
Carburetor: --
Distributor:--
Rated Power: 350 @ 1900
Maximum Torque:
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM		1103 @ 1400
Max. Engine Power, HP @ RPM	350 @ 1900	353 @ 1900
Cylinder Compression, psi min.-max. (avg.)		
Idle RPM		700
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	822	2100	352	3100		4100	
-		1200	974	2200		3200		4200	
-		1300	1065	2300		3300		4300	
400		1400	1103	2400		3400		4400	
500	505	1500	1101	2500		3500		4500	
600	358	1600	1074	2600		3600		4600	
700	644	1700	1046	2700		3700		4700	
800	646	1800	1010	2800		3800		4800	
900	682	1900	977	2900		3900		4900	
1000	709	2000	823	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-4 (Cont'd). DIESEL ENGINE 4 SUMMARY OF RESULTS
1979 Cummins NTCC-350

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D4-4	Speed	Torque	Power	Speed	Torque	Power
Standard Error	19.	6.%	6.%	18.	5.%	5.%
Slope	1.003	.919	.955	1.005	.924	.958
Corr. Coef.	.9986	.9556	.9605	.9987	.9666	.9714
Intercept	27.	2.6	1.1	24.	1.7	.7
Points Used	1176	934	934	1176	959	959
kW-hr Dev.[c]	----------	-10.7	----------	----------	-10.3	----------
TEST D4-7						
Standard Error	.19	4.%	3.%	25.	3.%	2.%
Slope	1.021	.935	.965	1.024	.952	1.016
Corr. Coef.	.9986	.9733	.9762	.9985	.9550	.9627
Intercept	7.	-10.7	-1.5	-0.	-9.9	-.8
Points Used	1176	899	899	1176	1020	1020
kW-hr Dev.[c]	----------	-15.3	----------	----------	-14.5	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D4-4	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	3.37	4.71	3.99	3.53	3.21	5.01	4.49	4.04
CO, gram	13.09	12.49	16.11	11.63	15.53	12.77	15.04	11.44
CO_2, gram	2058.7	2697.7	7003.4	1684.8	1684.1	2523.6	6681.2	1654.7
NOX, gram	12.42	18.60	63.67	13.13	11.64	19.35	59.96	12.38
FUEL, kg	0.659	0.861	2.220	0.540	0.542	0.807	2.118	0.531
KW-HR	1.82	2.80	9.31	1.82	1.84	2.91	9.26	1.82
TEST D4-7								
HC, gram	3.81	5.44	5.03	4.35	3.75	5.34	4.89	5.03
CO, gram	13.07	11.75	14.75	11.04	14.84	12.53	14.04	11.52
CO_2, gram	1953.4	2575.3	6740.2	1594.5	1621.6	2456.2	6570.1	1508.9
NOX, gram	11.22	17.44	60.41	11.95	11.08	18.36	58.46	11.12
FUEL, kg	0.626	0.823	2.137	0.513	0.522	0.786	2.083	0.486
KW-HR	1.70	2.70	8.87	1.68	1.74	2.79	8.87	1.70

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D4-4 = 744 mm Hg Test D4-7 = 746 mm Hg.

TABLE A-4(Cont'd). DIESEL ENGINE 4 SUMMARY OF RESULTS
1979 Cummins NTCC-350

DIESEL TRANSIENT CYCLE

	Test D4-4			Test D4-7			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	0.99	1.06	1.05	1.25	1.26	1.26	1.16
CO, g/kW-hr	3.38	3.46	3.45	3.38	3.51	3.49	3.47
CO_2, g/kW-hr	853.	792.	801.	860.	805.	813.	870.
NOX, g/kW-hr	6.84	6.53	6.57	6.76	6.56	6.59	6.58
SFC, kg/kW-hr	0.272	0.253	0.256	0.274	0.257	0.259	0.258
WORK, kW-hr	15.76	15.83	15.82	14.95	15.09	15.07	15.45
POWER, kW	47.28	47.43	47.41	44.85	45.27	45.21	46.31
Particulate, g/kW-hr	0.54	0.47	0.48	0.57	0.56	0.56	0.52
Filter Eff. %	95.4	95.5	95.5	96.0	96.4	96.3	95.9

13-MODE

	Test 4-1	Test 4-3	Average
HC, g/kW-hr	0.430	0.433	0.432
CO, g/kW-hr	4.26	4.58	4.42
NOX, g/kW-hr	7.33	8.11	7.72
SFC, kg/kW-hr	0.245	0.252	0.249
POWER, kW	89.9	86.4	88.2

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	1.16 (0.87)	HC	4.50	1.74
CO,	g/kW-hr (g/hp-hr)	3.47 (2.59)	CO	13.45	5.21
NOX,	g/kW-hr (g/hp-hr)	6.58 (4.91)	NOX	25.50	9.87
Particulate,	g/kW-hr (g/hp-hr)	0.52 (0.39)	Particulate	2.02	0.78
SFC,	kg/kW-hr(lb/hp-hr)	0.258 (0.424)	FUEL CONS.	--	387.
WORK,	kW-hr (hp-hr)	15.45 (20.72)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-5A. DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
#1 Fuel

ENGINE DESCRIPTION

Engine: 1978 Detroit Diesel 8V-71N No. 8VA-377265
Carburetor: --
Distributor: --
Rated Power:
Maximum Torque:
Comments: No. 1 Fuel

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM		771 @ 1300
Max. Engine Power, HP @ RPM		266 @ 2100
Cylinder Compression, psi min.-max. (avg.)		
Idle RPM	400	400
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	757	2100	660	3100		4100	
-		1200	770	2200	607	3200		4200	
-		1300	771	2300	0	3300		4300	
400	549	1400	763	2400		3400		4400	
500	621	1500	756	2500		3500		4500	
600	622	1600	744	2600		3600		4600	
700	665	1700	729	2700		3700		4700	
800	694	1800	715	2800		3800		4800	
900	724	1900	698	2900		3900		4900	
1000	744	2000	681	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-5A (Cont'd). DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
#1 Fuel

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D5-11	Speed	Torque	Power	Speed	Torque	Power
Standard Error	21.	8.%	8.%	21.	5.%	2.%
Slope	1.001	.901	.954	.999	.967	.996
Corr. Coef.	.9991	.9109	.9298	.9991	.9726	.9822
Intercept	25.	2.0	1.0	25.	-8.4	-1.2
Points Used	1176	964	964	1176	971	971
kW-hr Dev.[c]	----------	-6.2	----------	----------	-6.1	----------
TEST D5-12						
Standard Error	24.	9.%	81%	20.	5.%	2.%
Slope	1.001	.889	.939	1.001	.970	.999
Corr. Coef.	.9988	.9030	.9231	.9992	.9734	.9817
Intercept	25.	1.4	.8	24.	-8.6	-1.3
Points Used	1176	963	963	1176	971	971
kW-hr Dev.[c]	----------	-7.2	----------	----------	-6.1	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D5-11	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	2.29	4.48	8.56	3.16	5.20	5.97	10.08	3.61
CO, gram	8.66	11.09	37.09	5.82	8.44	12.98	32.32	5.55
CO_2, gram	1636.1	2222.5	6050.7	1272.5	1291.4	2089.1	5829.0	1279.7
NOX, gram	14.39	16.82	45.91	12.39	12.38	16.81	45.51	12.71
FUEL, kg	0.522	0.711	1.934	0.407	0.416	0.671	1.864	0.410
KW-HR	1.47	2.09	7.08	1.37	1.40	2.16	7.10	1.37
TEST D5-12								
HC, gram	2.91	5.29	9.93	3.44	4.62	6.05	10.37	3.64
CO, gram	9.03	11.58	38.81	5.86	8.02	13.87	32.31	5.92
CO_2, gram	1588.5	2220.8	6016.3	1269.2	1349.3	2157.8	5975.7	1299.7
NOX, gram	14.10	16.21	44.64	11.70	12.49	16.79	44.63	12.20
FUEL, kg	0.508	0.711	1.926	0.406	0.434	0.693	1.910	0.416
KW-HR	1.31	2.07	7.13	1.37	1.37	2.19	7.10	1.37

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 5-11 = 738 mm Hg Test 512 = 740 mm Hg.

TABLE A-5A (Cont'd). DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
#1 Fuel

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D5-13	Speed	Torque	Power	Speed	Torque	Power
Standard Error	23.	8.%	8.%	23.	5.%	2.%
Slope	1.002	.880	.934	1.000	.988	1.014
Corr. Coef.	.9989	.9035	.9245	.9989	.9686	.9791
Intercept	25.	2.6	1.1	25.	-10.8	-1.7
Points Used	1176	984	984	1176	969	969
kW-hr Dev.[c]	----------	-8.6	----------	----------	-5.4	----------
TEST						
Standard Error						
Slope						
Corr. Coef.						
Intercept						
Points Used						
kW-hr Dev.[c]						

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D5-13	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	3.51	5.86	11.37	3.71	4.30	6.02	11.12	4.22
CO, gram	9.57	11.47	33.90	5.38	7.16	14.67	33.52	6.29
CO_2, gram	1601.3	2298.7	6055.6	1317.1	1265.0	2125.0	5968.3	1332.8
NOX, gram	14.22	16.62	43.40	11.85	11.24	16.29	44.01	11.88
FUEL, kg	0.513	0.736	1.937	0.422	0.407	0.683	1.909	0.427
KW-HR	1.33	2.03	6.98	1.37	1.42	2.19	7.13	1.37
TEST								
HC, gram								
CO, gram								
CO_2, gram								
NOX, gram								
FUEL, kg								
KW-HR								

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 5-13 = 739 mm Hg Test = mm Hg.

TABLE A-5A (Cont'd). DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
#1

DIESEL TRANSIENT CYCLE

	Test D5-11			Test D5-12			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.54	2.07	1.99	1.82	2.05	2.02	2.04
CO, g/kW-hr	5.22	4.93	4.97	5.49	5.00	5.07	5.05
CO_2, g/kW-hr	931.	872.	880.	934.	897.	902.	892.
NOX, g/kW-hr	7.45	7.27	7.30	7.29	7.16	7.18	7.15
SFC, kg/kW-hr	0.298	0.279	0.282	0.299	0.287	0.289	0.286
WORK, kW-hr	12.01	12.03	12.03	11.88	12.03	12.01	12.03
POWER, kW	36.03	36.09	36.08	35.64	36.09	36.03	36.09
Particulate, g/kW-hr	0.59	0.98	0.92	0.71	0.93	0.90	0.92
Filter Eff. %	90.2	83.3	84.3	86.3	83.3	83.7	84.3

13-MODE

	Test D5-1	Test D5-2	Average
HC, g/kW-hr	1.180	1.074	1.127
CO, g/kW-hr	8.321	8.910	8.616
NOX, g/kW-hr	9.658	9.351	9.505
SFC, kg/kW-hr	0.278	0.277	0.278
POWER, kW	66.9	67.0	67.0

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	2.04 (1.52)	HC	7.13	2.38
CO,	g/kW-hr (g/hp-hr)	5.05 (3.77)	CO	17.66	5.90
NOX,	g/kW-hr (g/hp-hr)	7.15 (5.33)	NOX	25.00	8.35
Particulate,	g/kW-hr (g/hp-hr)	0.92 (0.69)	Particulate	3.22	1.07
SFC,	kg/kW-hr (lb/hp-hr)	0.286 (0.470)	FUEL CONS.	--	334.
WORK,	kW-hr (hp-hr)	12.03 (16.13)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-5A (Cont'd). DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
Fuel #1

DIESEL TRANSIENT CYCLE

	Test 5-13			Test			Average
	Cold	Hot	Composite	Cold	Hot	Composite	
HC, g/kW-hr	2.09	2.12	2.12				
CO, g/kW-hr	5.15	5.09	5.10				
CO_2, g/kW-hr	963.	883.	894.				
NOX, g/kW-hr	7.35	6.89	6.96				
SFC, kg/kW-hr	0.308	0.283	0.287				
WORK, kW-hr	11.71	12.11	12.05				
POWER, kW	35.13	36.33	36.16				
Particulate, g/kW-hr	1.20	0.88	0.93				
Filter Eff. %	88.7	84.3	84.9				

13-MODE

	Test	Test	Average
HC, g/kW-hr			
CO, g/kW-hr			
CO_2, g/kW-hr			
NOX, g/kW-hr			
SFC, kg/kW-hr			
POWER, kW			

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

		g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	HC	
CO,	g/kW-hr (g/hp-hr)	CO	
NOX,	g/kW-hr (g/hp-hr)	NOX	
Particulate,	g/kW-hr (g/hp-hr)	Particulate	
SFC,	kg/kW-hr (lb/hp-hr)	FUEL CONS.	
WORK,	kW-hr (hp-hr)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-5B. DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
#2 Fuel

ENGINE DESCRIPTION

Engine: 1978 Detroit Diesel 8V-71N No. 8VA-377265
Carburetor: --
Distributor: --
Rated Power:
Maximum Torque:
Comments: No. 2 Fuel

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM		779 @ 1300
Max. Engine Power, HP @ RPM		273 @ 2100
Cylinder Compression, psi min.-max. (avg.)		
Idle RPM		400
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	767	2100	682	3100		4100	
-		1200	768	2200	623	3200		4200	
-		1300	779	2300	0	3300		4300	
400	606	1400	772	2400		3400		4400	
500	638	1500	764	2500		3500		4500	
600	639	1600	747	2600		3600		4600	
700	678	1700	733	2700		3700		4700	
800	700	1800	723	2800		3800		4800	
900	727	1900	712	2900		3900		4900	
1000	747	2000	700	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-5B (Cont'd). DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
#2 Fuel

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D5-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	22.	8.%	7.%	22.	5.%	3.%
Slope	.984	.923	.953	1.002	.982	1.005
Corr. Coef.	.9990	.9198	.9392	.9990	.9715	.9803
Intercept	14.	-.4	.4	.15	-9.5	-1.2
Points Used	1176	972	972	1176	983	983
kW-hr Dev.[c]	----------	-8.2	----------	----------	-6.5	----------
TEST D5-4						
Standard Error	23.	7.%	5.%	23.	5.%	2.%
Slope	1.000	.978	1.015	.998	.980	1.000
Corr. Coef.	.9989	.9458	.9621	.9990	.9691	.9804
Intercept	17.	-4.4	.1	18.	-11.0	-1.6
Points Used	1176	910	910	1176	966	966
kW-hr Dev.[c]	----------	-7.2	----------	----------	-6.5	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D5-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	2.64	5.34	9.12	3.16	4.05	5.22	9.00	3.15
CO, gram	8.91	13.71	48.97	6.01	7.43	14.67	40.49	6.13
CO_2, gram	1507.6	2285.5	6039.2	1319.2	1332.9	2195.7	5868.8	1313.5
NOX, gram	15.27	18.84	49.81	14.00	13.34	18.22	46.77	13.26
FUEL, kg	0.478	0.727	1.922	0.419	0.425	0.699	1.864	0.417
KW-HR	1.42	2.07	7.10	1.37	1.44	2.21	7.20	1.38
TEST D5-4								
HC, gram	3.23	5.66	9.44	3.21	3.40	5.09	9.11	3.32
CO, gram	9.66	12.58	49.49	6.43	7.91	16.96	39.88	6.23
CO_2, gram	1630.3	2275.9	6343.8	1356.1	1315.7	2224.8	5912.0	1300.0
NOX, gram	14.97	17.71	49.29	13.16	13.22	18.94	47.53	13.27
FUEL, kg	0.518	0.724	2.018	0.430	0.419	0.709	1.877	0.413
KW-HR	1.42	2.05	7.20	1.42	1.44	2.19	7.19	1.37

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 5-2 = 743 mm Hg Test 5-4 = 746 mm Hg.

TABLE A-5B (Cont'd). DIESEL ENGINE 5 SUMMARY OF RESULTS
1978 Detroit Diesel 8V-71N
#2 Fuel

DIESEL TRANSIENT CYCLE

	Test D5-2			Test D5-4			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.70	1.75	1.74	1.78	1.72	1.73	1.74
CO, g/kW-hr	6.49	5.62	5.74	6.46	5.83	5.92	5.83
CO_2, g/kW-hr	933.	785.	883.	960.	883.	894.	889.
NOX, g/kW-hr	8.19	7.49	7.59	7.87	7.63	7.66	7.63
SFC, kg/kW-hr	0.297	0.278	0.281	0.305	0.281	0.284	0.283
WORK, kW-hr	11.96	12.24	12.20	10.10	12.18	12.17	12.19
POWER, kW	35.88	36.72	36.60	36.30	36.54	36.51	36.56
Particulate, g/kW-hr	1.02	1.10	1.09	1.07	1.02	1.03	1.06
Filter Eff. %	89.3	86.9	87.2	87.8	88.9	88.7	88.0

13-MODE

	Test D5-3	Test D5-4	Average
HC, g/kW-hr	0.924	0.923	0.924
CO, g/kW-hr	11.392	10.647	11.02
NOX, g/kW-hr	9.483	9.369	9.426
SFC, kg/kW-hr	0.274	0.276	0.275
POWER, kW	69.4	68.4	68.9

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	1.74 (1.30)	HC	6.15	2.06
CO,	g/kW-hr (g/hp-hr)	5.83 (4.35)	CO	20.60	6.90
NOX,	g/kW-hr (g/hp-hr)	7.63 (5.69)	NOX	26.96	9.03
Particulate,	g/kW-hr (g/hp-hr)	1.06 (0.79)	Particulate	3.75	1.26
SFC,	kg/kW-hr (lb/hp-hr)	0.283 (0.465)	FUEL CONS.	--	335.
WORK,	kW-hr (hp-hr)	12.19 (16.35)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-6A. DIESEL ENGINE 6 SUMMARY OF RESULTS
1979 DDAD 6V92TA No. 1 FUEL

ENGINE DESCRIPTION

Engine: Detroit Diesel Allison 6V92TA
Carburetor: N.A.
Distributor: N.A.
Rated Power: 270 @ 2100
Maximum Torque:
Comments: No. 1 Fuel

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM		748@1250
Max. Engine Power, HP @ RPM	270@2100	256@2100
Cylinder Compression, psi min.-max. (avg.)		
Idle RPM	500.	500.
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	742	2100	639	3100		4100	
-		1200	744	2200	350	3200		4200	
-		1300	744	2300	0	3300		4300	
400		1400	743	2400		3400		4400	
500	548	1500	742	2500		3500		4500	
600	605	1600	730	2600		3600		4600	
700	681	1700	707	2700		3700		4700	
800	703	1800	692	2800		3800		4800	
900	712	1900	678	2900		3900		4900	
1000	732	2000	658	3000		4000		5000	

VEHICLE DESCRIPTION

N.A.

TABLE A-6A (Cont'd). DIESEL ENGINE 6 SUMMARY OF RESULTS
1979 DDAD 6V92TA No. 1 FUEL

DIESEL TRANSIENT CYCLE

	Test D6-2			Test D6-3			Average
	Cold	Hot	Composite	Cold	Hot	Composite	
HC,	1.53	1.50	1.50	1.68	1.60	1.61	1.56
CO,	2.22	2.22	2.22	2.09	1.95	1.97	2.00
CO_2,	940.	870.	880.	891.	853.	858.	869.
NOX,	7.61	7.68	7.67	7.54	8.01	7.94	7.80
SFC,	0.299	0.277	0.280	0.284	0.272	0.274	0.277
WORK,	10.62	11.03	10.97	10.76	11.34	11.26	11.12
POWER,	31.9	33.1	32.9	32.3	34.0	33.8	33.4
Particulate, g/kW-hr	0.66	0.65	0.65	0.70	0.64	0.65	0.65
Filter Eff.	86.9	90.2	89.7	89.3	89.4	89.4	89.6

13-MODE

	Test D6-1	Test D6-2	Average
HC, g/kW-hr	1.293	1.337	1.315
CO, g/kW-hr	2.480	2.169	2.325
NOX, g/kW-hr	9.897	9.611	9.754
SFC, kg/kW-hr	0.264	0.263	0.264
POWER, kW	64.7	65.0	64.8

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	1.56 (1.16)	HC	5.63	1.68
CO,	g/kW-hr (g/hp-hr)	2.00 (1.49)	CO	7.22	2.16
NOX,	g/kW-hr (g/hp-hr)	7.80 (5.82)	NOX	28.2	8.42
Particulate,	g/kW-hr (g/hp-hr)	0.65 (0.48)	Particulate	2.35	0.70
SFC,	kg/kW-hr (lb/hp-hr)	0.277 (0.455)	FUEL CONS.	---	299.
WORK,	kW-hr (hp-hr)	11.12 (14.91)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-6A (Cont'd). DIESEL ENGINE 6 SUMMARY OF RESULTS
1979 DDAD 6V92TA No. 1 FUEL

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D6-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	20.	6.%	7.%	21.	6.%	4.%
Slope	0.996	0.974	0.984	0.993	0.982	0.991
Corr. Coef.	0.9990	0.9414	0.9523	0.9989	0.9597	0.9725
Intercept	22.	4.9	2.2	24.	-6.0	-1.0
Points Used	**1176**	857	857	1176	910	910
kW-hr Dev.[c]		-13%			-10%	
TEST D6-3						
Standard Error	21.	7.%	6.%	21.	5.%	4.%
Slope	0.996	0.981	0.994	0.999	0.998	1.002
Corr. Coef.	0.9990	0.9306	0.9513	0.9990	0.9639	0.9730
Intercept	23.	-2.0	0.1	20.	-6.8	-0.8
Points Used	1176	849	849	1176	898	898
kW-hr Dev.[c]		-12%			-7%	

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D6-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	2.33	3.37	7.41	3.14	2.75	3.71	7.05	3.08
CO, gram	5.10	4.88	7.46	6.13	6.10	4.70	7.47	6.21
CO_2, gram	1498.7	1976.2	5206.2	1303.1	1257.3	1932.4	5147.8	1257.4
NOX, gram	11.0	14.08	42.85	12.97	12.28	16.10	44.04	12.27
FUEL, kg	0.477	0.629	1.652	0.417	0.402	0.615	1.634	0.403
KW-HR	1.07	1.81	6.43	1.31	1.37	2.00	6.35	1.31
TEST D6-3								
HC, gram	2.78	3.92	7.99	3.38	2.93	4.00	7.76	3.50
CO, gram	5.24	4.64	6.93	5.66	5.41	4.35	6.59	5.72
CO_2, gram	1313.1	1841.7	5122.2	1313.8	1286.0	1893.4	5223.1	1273.7
NOX, gram	10.43	13.59	44.08	13.06	13.11	16.76	47.18	13.83
FUEL, kg	0.419	0.587	1.626	0.420	0.411	0.603	1.658	0.408
KW-HR	1.05	1.81	6.56	1.35	1.40	2.07	6.54	1.33

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D6-2 = 741. mm Hg Test D6-3 = 748. mm Hg.

TABLE A-6B. DIESEL ENGINE 6 SUMMARY OF RESULTS
1979 DDAD 6V92TA No. 2 FUEL

ENGINE DESCRIPTION

Engine: Detroit Diesel Allison 6V-92TA
Carburetor:
Distributor:
Rated Power:
Maximum Torque:
Comments: No. 2 Fuel

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	---	783@1400
Max. Engine Power, HP @ RPM	---	274@2100
Cylinder Compression, psi min.-max. (avg.)	---	---
Idle RPM	500	500

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	777	2100	684	3100		4100	
-		1200	781	2200	397	3200		4200	
-		1300	779	2300	0	3300		4300	
400		1400	783	2400		3400		4400	
500	555	1500	779	2500		3500		4500	
600	631	1600	770	2600		3600		4600	
700	700	1700	752	2700		3700		4700	
800	728	1800	733	2800		3800		4800	
900	737	1900	718	2900		3900		4900	
1000	766	2000	698	3000		4000		5000	

VEHICLE DESCRIPTION

N.A.

TABLE A-6B (Cont'd). DIESEL ENGINE 6 SUMMARY OF RESULTS

1979 DDAD 6V92TA No. 2 FUEL

DIESEL TRANSIENT CYCLE

	Test D6-5			Test D6-6			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	1.52	1.55	1.55	1.31	1.35	1.34	1.44
CO,	2.40	2.36	2.37	2.54	2.42	2.44	2.40
CO_2,	848.	844.	845.	898.	865.	870.	858.
NOX,	7.14	7.53	7.47	7.97	8.22	8.18	7.82
SFC,	0.268	0.267	0.267	0.283	0.273	0.274	0.270
WORK,	11.80	12.11	12.07	11.34	11.71	11.66	11.86
POWER,	35.43	36.36	36.23	34.05	35.16	35.00	35.62
Particulate, g/kW-hr	0.76	0.74	0.74	0.80	0.73	0.74	0.74
Filter Eff.	90.5	90.5	90.5	92.5	90.2	90.5	90.5

13-MODE

	Test D6-3	Test D6-5	Average
HC, g/kW-hr	1.172	1.206	1.189
CO, g/kW-hr	2.444	2.786	2.615
NOX, g/kW-hr	10.311	10.019	10.165
SFC, kg/kW-hr	0.267	0.262	0.264
POWER, kW	68.7	69.4	69.0

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	1.44 (1.07)	HC	5.33	1.66
CO,	g/kW-hr (g/hp-hr)	2.40 (1.79)	CO	8.89	2.76
NOX,	g/kW-hr (g/hp-hr)	7.82 (5.83)	NOX	29.0	9.00
Particulate,	g/kW-hr (g/hp-hr)	0.74 (0.55)	Particulate	2.74	0.85
SFC,	kg/kW-hr (lb/hp-hr)	0.270 (0.444)	FUEL CONS.	---	311.
WORK,	kW-hr (hp-hr)	11.86 (15.90)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-6B (Cont'd). DIESEL ENGINE 6 SUMMARY OF RESULTS
1979 DDAD 6V92TA No. 2 FUEL

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D6-5	Speed	Torque	Power	Speed	Torque	Power
Standard Error	22.	7.%	8.%	22.	7.%	5.%
Slope	1.007	0.994	1.018	1.004	0.996	1.016
Corr. Coef.	0.9989	0.9289	0.9403	0.9989	0.9421	0.9600
Intercept	12.	1.6	1.4	14.	-6.0	-1.1
Points Used	1176	865	865	1176	907	907
kW-hr Dev.[c]						
TEST D6-6						
Standard Error	18.	7.%	6.%	20.	5.%	5.%
Slope	0.998	0.973	0.988	0.999	0.981	0.986
Corr. Coef.	0.9992	0.9376	0.9536	0.9991	0.9684	0.9742
Intercept	14.	-1.7	0.3	11.	-3.9	0.0
Points Used	1176	873	873	1176	909	909
kW-hr Dev.[c]						

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D6-5	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	2.63	3.97	7.73	3.65	3.28	4.22	7.60	3.72
CO, gram	8.65	5.05	7.01	7.60	7.17	6.27	7.09	8.12
CO_2, gram	1503.3	2035.3	5146.4	1313.6	1364.8	2077.6	5367.5	1415.5
NOX, gram	11.50	15.29	44.06	13.39	13.00	17.54	47.16	13.48
FUEL, kg	0.477	0.643	1.621	0.418	0.434	0.657	1.690	0.450
KW-HR	1.35	2.00	7.03	1.42	1.45	2.23	7.03	1.40
TEST D6-6								
HC, gram	2.08	3.09	6.73	2.94	2.55	3.48	6.65	3.08
CO, gram	8.85	5.17	7.32	7.46	7.24	5.36	7.36	8.34
CO_2, gram	1299.7	2208.7	5358.9	1319.7	1314.1	2040.5	5463.0	1311.8
NOX, gram	11.28	16.47	48.78	13.87	13.63	18.21	50.63	13.79
FUEL, kg	0.413	0.696	1.686	0.419	0.417	0.644	1.719	0.417
KW-HR	1.28	1.86	6.82	1.38	1.40	2.12	6.82	1.37

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D6-5 = 740 mm Hg Test D6-6 = 743 mm Hg.

TABLE A-7. DIESEL ENGINE 7 SUMMARY OF RESULTS
IHC DTI-466B

ENGINE DESCRIPTION

Engine: International Harvester DTI-466B
Carburetor: N.A.
Distributor: N.A.
Rated Power:
Maximum Torque:
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	? @ 1800	478@1800
Max. Engine Power, HP @ RPM	? @ 2600	208@2500
Cylinder Compression, psi min.-max. (avg.)	N.A.	N.A.
Idle RPM	700	720
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	281.	2100	462.	3100		4100	
-		1200	288.	2200	459.	3200		4200	
-		1300	292.	2300	452.	3300		4300	
400	-	1400	324.	2400	446.	3400		4400	
500	-	1500	436.	2500	438.	3500		4500	
600	-	1600	452.	2600	406.	3600		4600	
700	219.	1700	464.	2700	287.	3700		4700	
800	237.	1800	478.	2800	120.	3800		4800	
900	260.	1900	474.	2900	0.	3900		4900	
1000	273.	2000	468.	3000		4000		5000	

VEHICLE DESCRIPTION

N.A.

TABLE A-7 (Cont'd). DIESEL ENGINE 7 SUMMARY OF RESULTS
IHC DTI-466B

DIESEL TRANSIENT CYCLE

	Test D7-1			Test D7-2			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	1.31	1.07	1.10	1.23	1.10	1.12	1.11
CO,	2.41	1.92	1.99	2.28	1.92	1.97	1.98
CO_2,	965.	920.	926.	862.	873.	871.	898.
NOX,	8.52	7.88	7.97	6.91	6.95	6.94	7.46
SFC,	0.307	0.292	0.294	0.274	0.277	0.277	0.285
WORK,	8.98	9.01	9.01	9.34	9.13	9.16	9.08
POWER,	27.0	27.1	27.1	28.0	27.4	27.5	27.3
Particulate, g/kW-hr	0.57	0.47	0.48	0.53	0.47	0.48	0.48
Filter Eff.	93.6	96.0	95.7	93.3	95.3	95.0	95.3

13-Mode

	Test D7-1	Test D7-2	Average
HC, g/kW-hr	.771	.833	.802
CO, g/kW-hr	1.759	1.500	1.630
NOX, g/kW-hr	7.532	7.732	7.632
SFC, kg/kW-hr	.267	.268	0.268
POWER, kW	59.0	59.3	59.2

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

		g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr) 1.11 (0.83)	HC	3.89	0.98
CO,	g/kW-hr (g/hp-hr) 1.98 (1.48)	CO	6.95	1.75
NOX,	g/kW-hr (g/hp-hr) 7.46 (5.56)	NOX	26.18	6.58
Particulate,,	g/kW-hr (g/hp-hr) 0.48 (0.36)	Particulate	1.68	0.42
SFC,	kg/kW-hr(lb/hp-hr) 0.285(0.469)	FUEL CONS.	--	251.
WORK	kW-hr (hp-hr) 9.08 (12.18)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-7 (Cont'd). DIESEL ENGINE 7 SUMMARY OF RESULTS
IHC DTI-466B

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D7-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	77.	6.%	4.%	28.	5.%	3.%
Slope	1.010	.972	1.002	.999	.983	1.002
Corr. Coef.	.9904	.9560	.9675	.9987	.9670	.9717
Intercept	6.	-4.1	-1.6	27.	-5.6	-1.7
Points Used	1176	976	976	1176	973	973
kW-hr Dev.[c]	----------	-9%	----------	----------	-9%	----------
TEST D7-2						
Standard Error	26.	5.%	4.%	25.	5.%	3.%
Slope	.997	.962	-987	1.000	.967	.989
Corr. Coef.	.9988	.9695	.9756	.9989	.9696	.9746
Intercept	24.	-1.4	-.6	19.	-3.3	-1.2
Points Used	1176.	977	977	1176	979	979
kW-hr Dev.[c]	----------	-6%	----------	----------	-8%	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D7-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	2.95	2.68	4.31	1.79	1.60	2.10	4.07	1.90
CO, gram	7.37	5.42	5.21	3.61	4.11	4.36	5.24	3.63
CO_2, gram	1257.8	1709.4	4677.3	1014.4	1062.6	1605.1	4582.2	1037.8
NOX, gram	11.48	14.06	41.45	9.47	9.43	12.76	39.48	9.29
FUEL, kg	.403	.544	1.481	.323	.339	.510	1.451	.331
KW-HR	.95	1.54	5.57	.91	.98	1.56	5.54	.93
TEST D7-2								
HC, gram	2.84	2.63	4.09	1.88	1.70	2.30	4.11	1.95
CO, gram	7.68	5.00	5.00	3.66	4.15	4.44	5.27	3.67
CO_2, gram	1228.3	1535.6	4368.0	918.0	1040.2	1501.9	4473.7	956.6
NOX, gram	10.50	11.59	34.53	7.98	9.05	11.78	34.27	8.36
FUEL, kg	.394	.489	1.381	.293	.332	.478	1.417	.305
KW-HR	.95	1.63	5.77	1.00	1.02	1.58	5.59	.95

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 7-1 = 741 mm Hg Test 7-2 = 733 mm Hg.

TABLE A-8. DIESEL ENGINE 9 SUMMARY OF RESULTS
1979 Mack ETAZ(B)673A

ENGINE DESCRIPTION

Engine: Mack ETAZ (B) 673A
Carburetor: N.A.
Distributor: N.A.
Rated Power: 315 hp @ 1900 rpm
Maximum Torque: 1050 ft-lb @ 1450 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	1050 @ 1450	1048 @ 1400
Max. Engine Power, HP @ RPM	315 @ 1900	316 @ 1900
Cylinder Compression, psi min.-max. (avg.)	N.A.	N.A.
Idle RPM	650	650

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 75% Baro. - 29.35 in. Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	768	2100	210	3100		4100	
-	-	1200	990	2200	0	3200		4200	
-	-	1300	1030	2300		3300		4300	
400	-	1400	1048	2400		3400		4400	
500	-	1500	1037	2500		3500		4500	
600	371	1600	1006	2600		3600		4600	
700	384	1700	970	2700		3700		4700	
800	440	1800	924	2800		3800		4800	
900	498	1900	874	2900		3900		4900	
1000	590	2000	656	3000		4000		5000	

VEHICLE DESCRIPTION

N.A.

TABLE A-8 (Cont'd). DIESEL ENGINE 9 SUMMARY OF RESULTS
1979 Mack ETAZ(B)673A

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST	Speed	Torque	Power	Speed	Torque	Power
Standard Error	20.	5.%	4.%	18.	5.%	3.%
Slope	1.001	.957	1.006	.999	.983	1.011
Corr. Coef.	.9986	.9718	.9801	.9988	.9719	.9772
Intercept	39.	5.8	-.3	33.	-8.2	-1.9
Points Used	1176	976	976	1176	967	967
kW-hr Dev.[c]	-------	-6.6%	------	-------	-6.7%	---------
TEST						
Standard Error	29.	5.%	4.%	20.	4.%	4.%
Slope	1.000	.987	1.020	1.001	.980	1.011
Corr. Coef.	.9968	.9658	.9737	.9985	.9800	.9772
Intercept	32.	-3.7	-1.0	30.	-.2	-1.9
Points Used	1176	945	945	1176	951	967
kW-hr Dev.[c]	-------	07.8%	------	-------	-6.3%	---------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	3.73	3.65	5.68	2.89	2.89	3.66	6.16	3.43
CO, gram	27.20	31.71	12.10	7.11	7.54	3.56	11.22	6.75
CO_2, gram	1598.0	2521.8	6465.8	1420.9	1465.1	2321.9	6215.8	1379.1
NOX, gram	16.38	20.69	56.16	17.39	14.34	19.37	56.64	9.89
FUEL, kg	0.521	0.814	2.050	0.454	0.468	0.737	1.971	0.442
KW-HR	1.62	2.76	8.76	1.72	1.67	2.73	8.85	1.60
TEST								
HC, gram	3.11	3.51	5.86	2.98	2.68	3.43	6.13	3.45
CO, gram	9.52	10.09	11.73	6.55	7.79	7.88	11.04	6.75
CO_2 gram	1610.7	2499.3	6593.0	1429.7	1564.0	2237.0	6173.0	1693.6
NOX, gram	16.69	20.57	59.16	16.20	16.20	19.54	56.42	14.32
FUEL, kg	0.516	0.796	2.090	0.457	0.500	0.713	1.958	0.541
KW-HR	1.51	2.67	8.87	1.62	1.71	2.74	8.87	1.60

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 9.2 = 752 mm Hg Test 9.3 = 755 mm Hg.

TABLE A-8 (Cont'd). DIESEL ENGINE 9 SUMMARY OF RESULTS
1979 Mack ETAZ(B)673A

DIESEL TRANSIENT CYCLE

	Test			Test			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.07	1.09	1.09	1.05	1.05	1.05	1.07
CO, g/kW-hr	5.26	1.96	2.43	2.58	2.24	2.29	2.36
CO_2, g/kW-hr	808.	767.	773.	827.	782.	788.	781.
NOX, g/kW-hr	7.44	6.75	6.85	7.68	7.14	7.22	7.04
SFC, kg/kW-hr	0.258	0.244	0.246	0.263	0.249	0.251	0.249
WORK, kW-hr	14.86	14.85	14.85	14.67	14.92	14.88	14.87
POWER, kW	44.6	44.6	44.6	44.0	44.8	44.7	44.7
Particulate, g/kW-hr	1.11	0.74	0.79	0.72	0.75	0.75	0.77
Filter Eff. %	98.	98.	98.	97.	97.	97.	97.5

13-MODE

	Test D9-1	Test D9-2	Average
HC, g/kW-hr	0.759	0.751	0.755
CO, g/kW-hr	1.737	1.752	1.745
CO_2, g/kW-hr			
NOX, g/kW-hr	8.203	8.167	8.185
SFC, kg/kW-hr	0.238	0.237	0.238
POWER, kW	91.6	91.7	91.7

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	1.07	(0.80)	4.30	1.54
CO,	g/kW-hr (g/hp-hr)	2.36	(1.76)	9.48	3.41
NOX,	g/kW-hr (g/hp-hr)	7.04	(5.25)	28.27	10.16
Particulate,	g/kW-hr (g/hp-hr)	0.77	(0.57)	3.09	1.11
SFC,	kg/kW-hr (lb/hp-hr)	0.249	(0.410)	--	359.
WORK,	kW-hr (hp-hr)	14.87	(19.94)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-9. DIESEL ENGINE 10 SUMMARY OF RESULTS
1979 Mack ETSX-676-01

ENGINE DESCRIPTION

Engine: 1979 Mack ETSX-676-01
Carburetor: --
Distributor:--
Rated Power: 283 @ 2100
Maximum Torque: 1080 @ 1200
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	1080 @ 1200	1136 @ 1230
Max. Engine Power, HP @ RPM	283 @ 2100	314 @ 1900
Cylinder Compression, psi min.-max. (avg.)	--	--
Idle RPM	575	580

Comments:

POWER MAPPING (TQ in ft-lb) @ Temp. - 77 Baro. - 29.35

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	1103	2100	769	3100		4100	
-		1200	1129	2200	635	3200		4200	
-		1300	1119	2300	0	3300		4300	
400		1400	1064	2400		3400		4400	
500	392	1500	1016	2500		3500		4500	
600	385	1600	975	2600		3600		4600	
700	453	1700	939	2700		3700		4700	
800	387	1800	908	2800		3800		4800	
900	545	1900	867	2900		3900		4900	
1000	564	2000	817	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-9 (Cont'd). DIESEL ENGINE 10 SUMMARY OF RESULTS
1979 Mack ETSX-676-01

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 10-4	Speed	Torque	Power	Speed	Torque	Power
Standard Error	73.	6.%	7.%	63.	5.%	7.%
Slope	1.006	.964	1.009	1.008	.960	1.005
Corr. Coef.	.9868	.9277	.9445	.9900	.9573	.9649
Intercept	19.	2.8	-.2	17.	8.4	1.4
Points Used	1176	938	938	1176	945	945
kW-hr Dev.[c]	----------	-6.7	----------	----------	-7.0	----------
TEST 10-6						
Standard Error	68.	6.%	7.%	61.	5.%	6.%
Slope	1.001	.970	1.014	1.002	.981	1.017
Corr. Coef.	.9883	.9304	.9458	.9906	.9549	.9639
Intercept	33.	-2.2	-.7	29.	-3.5	-.9
Points Used	1176	938	938	1176	942	942
kW-hr Dev.[c]	----------	-7.0	----------	----------	-6.4	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST 10-4	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	1.28	1.66	4.37	1.24	1.09	1.67	3.89	0.70
CO, gram	6.05	7.65	13.20	4.66	5.61	7.62	14.05	4.81
CO_2, gram	1980.2	2787.8	7311.5	1665.9	1753.6	2667.5	7187.8	1584.5
NOX, gram	11.55	17.65	58.79	12.88	11.45	19.93	59.46	12.70
FUEL, kg	0.629	0.884	2.316	0.529	0.557	0.846	2.277	0.503
KW-HR	1.76	2.76	8.67	1.76	1.83	2.80	8.67	1.74
TEST 10-6								
HC, gram	1.52	1.87	4.38	1.00	0.79	1.63	4.27	1.11
CO, gram	6.39	7.73	13.54	4.69	5.64	7.98	14.81	5.06
CO_2, gram	2008.7	2736.3	7295.6	1687.8	1753.8	2646.1	7179.4	1682.8
NOX, gram	12.45	18.10	60.41	13.44	11.85	19.01	60.01	12.73
FUEL, kg	0.638	0.868	2.311	0.535	0.556	0.840	2.275	0.534
KW-HR	1.79	2.76	8.71	1.72	1.78	2.76	8.69	1.72

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 10-4 = 741 mm Hg Test 10-6 = 741 mm Hg.

TABLE A-10A. ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 2

ENGINE DESCRIPTION

Engine: 1979 Cummins VTB-903 Coach
Carburetor: -
Distributor: -
Rated Power: 278 @ 2100
Maximum Torque: @ 1500
Comments: No. 2 fuel

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	@ 1500	766 @ 1600
Max. Engine Power, HP @ RPM	278 @ 2100	270 @ 2100
Cylinder Compression, psi min.-max. (avg.)	-	-
Idle RPM	625	650
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - 78 Baro. - 29.69

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	475	2100	676	3100		4100	
-	-	1200	519	2200	372	3200		4200	
-	-	1300	584	2300	180	3300		4300	
400	285	1400	687	2400	0	3400		4400	
500	355	1500	764	2500		3500		4500	
600	428	1600	766	2600		3600		4600	
700	435	1700	758	2700		3700		4700	
800	438	1800	747	2800		3800		4800	
900	438	1900	729	2900		3900		4900	
1000	464	2000	707	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-9 (Cont'd). DIESEL ENGINE 10 SUMMARY OF RESULTS
1979 Mack ETSX-676-01

DIESEL TRANSIENT CYCLE

	Test 10-4			Test 10-6			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	0.57	0.49	0.50	0.59	0.52	0.53	0.52
CO, g/kW-hr	2.11	2.13	2.13	2.16	2.24	2.23	2.18
CO_2, g/kW-hr	919.	877.	883.	916.	887.	891.	887.
NOX, g/kW-hr	6.75	6.88	6.86	6.97	6.93	6.94	6.90
SFC, kg/kW-hr	0.291	0.278	0.280	0.290	0.281	0.282	0.281
WORK, kW-hr	14.95	15.04	15.03	14.99	14.95	14.96	15.00
POWER, kW	44.9	45.1	45.0	45.0	44.9	45.0	45.0
Particulate, g/kW-hr	0.81	0.81	0.81	0.90	0.88	0.88	0.85
Filter Eff. %	98.	98.	98.	72.	97.	93.	96.

13-MODE

	Test 10-1	Test 10-2	Average
HC, g/kW-hr	0.474	0.458	0.466
CO, g/kW-hr	2.447	2.453	2.450
NOX, g/kW-hr	4.946	5.122	5.034
SFC, kg/kW-hr	0.249	0.249	0.249
POWER, kW	86.7	85.2	86.0

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	0.52 (0.39)	HC	1.85	0.76
CO,	g/kW-hr	(g/hp-hr)	2.18 (1.63)	CO	7.76	3.17
NOX,	g/kW-hr	(g/hp-hr)	6.90 (5.15)	NOX	24.56	10.05
Particulate,	g/kW-hr	(g/hp-hr)	0.85 (0.63)	Particulate	3.02	1.24
SFC,	kg/kW-hr	(lb/hp-hr)	0.281 (0.462)	FUEL CONS.	--	409.
WORK,	kW-hr	(hp-hr)	15.00 (20.12)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-10A (Cont'd). ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 2

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D11-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	49.	6.%	6.%	33.	8.%	6.%
Slope	1.008	.951	.992	1.003	.949	.988
Corr. Coef.	.9935	.9554	.9659	.9969	.9344	.9539
Intercept	6.	4.9	.9	12.	.9	-.5
Points Used	1176	970	970	1176	988	988
kW-hr Dev.[c]	----------	-6.5	----------	----------	-6.5	----------
TEST D11-2						
Standard Error	38.	8.%	7.%	34.	5.%	5.%
Slope	.995	.980	1.015	.998	.984	1.015
Corr. Coef.	.9960	.9310	.9474	.9966	.9685	.9771
Intercept	15.	2.8	-.0	12.	4.3	.5
Points Used	1176	965	965	1176	959	959
kW-hr Dev.[c]	----------	-5.6	----------	----------	-5.4	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D11-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	7.90	11.70	15.45	5.51	4.40	6.58	5.71	4.38
CO, gram	7.95	7.51	8.74	4.52	4.96	6.12	7.30	4.78
CO_2, gram	1802.5	2307.2	5905.5	1405.3	1374.9	2146.0	5792.8	1377.4
NOX, gram	10.55	17.83	61.34	9.42	9.42	19.83	69.71	10.66
FUEL, kg	0.580	0.743	1.881	0.451	0.440	0.686	1.835	0.441
KW-HR	1.34	2.23	7.35	1.25	1.28	2.29	7.34	1.27
TEST D11-2								
HC, gram	7.41	9.92	13.77	4.98	3.99	5.95	5.22	4.09
CO, gram	8.16	7.53	9.12	4.73	4.85	5.69	6.70	4.40
CO_2 gram	1618.2	2219.5	5765.6	1391.4	1399.6	2161.0	5692.3	1316.8
NOX, gram	9.70	16.67	61.50	9.22	9.37	19.54	69.27	10.37
FUEL, kg	0.522	0.713	1.836	0.446	0.448	0.690	1.803	0.421
KW-HR	1.37	2.25	7.39	1.27	1.32	2.29	7.42	1.28

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: TestD11-1= 752 mm Hg TestD11-2 = 745 mm Hg.

TABLE A-10A (Cont'd). ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 2

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D11-3	Speed	Torque	Power	Speed	Torque	Power
Standard Error	34.	7.%	6.%	33.	7.%	6.%
Slope	1.002	.959	1.000	1.000	.954	.993
Corr. Coef.	.9968	.9431	.9613	.9969	.9373	.9580
Intercept	14.	5.8	.8	14.	1.9	-.6
Points Used	1176	954	954	1176	970	970
kW-hr Dev.[c]	----------	-6.6	----------	----------	-6.7	---------
TEST						
Standard Error						
Slope						
Corr. Coef.						
Intercept						
Points Used						
kW-hr Dev.[c]						

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D11-3	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	7.61	9.79	12.81	4.96	4.22	5.80	5.83	4.22
CO, gram	7.85	7.39	8.67	4.88	5.08	6.21	7.36	4.42
CO_2, gram	1671.8	2256.4	5734.8	1330.2	1340.6	2142.2	5658.2	1261.2
NOX, gram	7.06	13.45	49.97	7.00	6.52	15.08	53.45	7.13
FUEL, kg	0.539	0.725	1.825	0.427	0.429	0.684	1.793	0.404
KW-HR	1.34	2.25	7.30	1.27	1.32	2.27	7.30	1.25
TEST								
HC, gram								
CO, gram								
CO_2, gram								
NOX, gram								
FUEL, kg								
KW-HR								

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: TestD11-3 = 746 mm Hg Test = mm Hg.

TABLE A-10A (Cont'd). ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 2

DIESEL TRANSIENT CYCLE

	Test D11-1			Test D11-2			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	3.33	1.73	1.96	2.94	1.56	1.76	1.85
CO, g/kW-hr	2.36	1.90	1.97	2.41	1.76	1.85	1.93
CO_2, g/kW-hr	938	878	887	895	858	863	871
NOX, g/kW-hr	8.14	9.01	8.89	7.91	8.82	8.69	8.10
SFC, kg/kW-hr	0.300	0.280	0.283	0.286	0.273	0.275	0.278
WORK, kW-hr	12.17	12.17	12.17	12.28	12.31	12.31	12.21
POWER, kW	36.51	36.51	36.51	36.84	36.93	36.92	36.62
Particulate, g/kW-hr	0.63	0.48	0.50	0.68	0.50	0.53	0.53
Filter Eff. %	87	91	90	88	91	90	90

13-MODE

	Test D11-1	Test D11-2	Average
HC, g/kW-hr	0.944	0.969	0.957
CO, g/kW-hr	2.412	1.988	2.200
NOX, g/kW-hr	0.224	9.352	9.288
SFC, kg/kW-hr	0.254	0.254	0.254
POWER, kW	72	72	72

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %		N.A.	
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	1.85	(1.38)	6.66	2.19
CO,	g/kW-hr (g/hp-hr)	1.93	(1.44)	6.94	2.29
NOX,	g/kW-hr (g/hp-hr)	8.10	(6.04)	29.14	9.60
Particulate,	g/kW-hr (g/hp-hr)	0.53	(0.40)	1.91	0.63
SFC,	kg/kW-hr (lb/hp-hr)	0.278	(0.457)	FUEL CONS.	330.
WORK,	kW-hr (hp-hr)	12.21	(16.37)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-10A (Cont'd). ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 2

DIESEL TRANSIENT CYCLE

	Test D11-3			Test			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	2.89	1.65	1.83				
CO, g/kW-hr	2.37	1.90	1.97				
CO_2, g/kW-hr	904	857	864				
NOX, g/kW-hr	6.37	6.77	6.71				
SFC, kg/kW-hr	0.289	0.273	0.275				
WORK, kW-hr	12.16	12.14	12.14				
POWER, kW	36.48	36.42	36.43				
Particulate, g/kW-hr	0.69	0.53	0.55				
Filter Eff. %	87	91	90				

13-MODE

	Test	Test	Average
HC, g/kW-hr			
CO, g/kW-hr			
CO_2, g/kW-hr			
NOX, g/kW-hr		N.A.	
SFC, kg/kW-hr			
POWER, kW			

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %		N.A.	
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

		g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	HC	
CO,	g/kW-hr (g/hp-hr)	CO	
NOX,	g/kW-hr (g/hp-hr)	NOX	
Particulate,	g/kW-hr (g/hp-hr)	Particulate	
SFC,	kg/kW-hr (lb/hp-hr)	FUEL CONS.	
WORK,	kW-hr (hp-hr)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-10B. ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 1

ENGINE DESCRIPTION

Engine: 1979 Cummins VTB-903 Coach
Carburetor: -
Distributor: -
Rated Power: -
Maximum Torque: -
Comments: No. 1 Fuel

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	-	756 @ 1500
Max. Engine Power, HP @ RPM	-	263 @ 2000
Cylinder Compression, psi min.-max. (avg.)	-	
Idle RPM		650
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - 78 Baro. - 29.40

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	494	2100	657	3100		4100	
-	-	1200	555	2200	297	3200		4200	
-	-	1300	649	2300	158	3300		4300	
400	291	1400	724	2400		3400		4400	
500	364	1500	756	2500		3500		4500	
600	437	1600	754	2600		3600		4600	
700	440	1700	744	2700		3700		4700	
800	436	1800	729	2800		3800		4800	
900	439	1900	711	2900		3900		4900	
1000	463	2000	691	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-10B (Cont'd). ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 1

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D11-4	Speed	Torque	Power	Speed	Torque	Power
Standard Error	36.	6.%	6.%	36.	7.%	6.%
Slope	1.002	.980	1.015	1.001	.966	1.006
Corr. Coef.	.9963	.9498	.9651	.9964	.9345	.9530
Intercept	13.	2.6	-.1	15.	2.3	-.4
Points Used	1176	944	944	1176	955	955
kW-hr Dev.[c]	----------	-6.5	---------	----------	-6.0	----------
TEST D11-5						
Standard Error	34.	5.%	5.%	33.	6.%	6.%
Slope	1.003	.963	.992	1.003	.951	.985
Corr. Coef.	.9967	.9655	.9757	.9970	.9519	.9676
Intercept	10.	1.2	.2	9.	2.7	.5
Points Used	1176	933	933	1176	955	955
kW-hr Dev.[c]	----------	-9.5	---------	----------	-8.1	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D11-4	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	8.60	7.46	8.45	5.89	6.39	7.40	4.60	5.77
CO, gram	6.98	6.19	6.81	5.42	6.07	6.68	6.47	6.01
CO_2, gram	1660.2	2275.7	5549.8	1362.9	1441.6	2117.6	5564.6	1402.2
NOX, gram	7.96	12.44	46.36	6.26	6.26	13.96	50.88	6.54
FUEL, kg	0.535	0.728	1.761	0.438	0.464	0.678	1.762	0.451
KW-HR	1.25	2.22	7.19	1.28	1.34	2.22	7.16	1.30
TEST D11-5								
HC, gram	8.24	7.42	7.57	7.38	7.63	8.62	5.19	7.09
CO, gram	7.33	6.69	7.43	7.26	6.90	7.25	6.80	6.65
CO_2 gram	1590.6	2246.6	5607.1	1371.8	1371.8	2041.3	5420.9	1291.1
NOX, gram	6.32	12.12	45.47	6.46	5.82	13.39	48.50	6.62
FUEL, kg	0.513	0.719	1.779	0.443	0.444	0.656	1.717	0.417
KW-HR	1.20	2.08	7.04	1.27	1.30	2.13	7.04	1.28

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: TestD11-4= 748 mm Hg TestD11-5 = 741 mm Hg.

TABLE A-10B (Cont'd). ENGINE D-11 SUMMARY OF RESULTS
1979 Cummins VTB-903 Coach
Fuel No. 1

DIESEL TRANSIENT CYCLE

	Test D11-4			Test D11-5			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	2.55	2.01	2.09	2.64	2.43	2.46	2.28
CO, g/kW-hr	2.13	2.10	2.10	2.48	2.35	2.37	2.24
CO_2, g/kW-hr	908	876	881	934	862	872	877
NOX, g/kW-hr	6.11	6.46	6.41	6.08	6.33	6.29	6.35
SFC, kg/kW-hr	0.290	0.279	0.281	0.298	0.275	0.278	0.280
WORK, kW-hr	11.94	12.01	12.00	11.58	11.75	11.73	11.87
POWER, kW	35.82	36.03	36.00	34.74	35.25	35.18	35.59
Particulate, g/kW-hr	0.45	0.43	0.43	0.44	0.43	0.43	0.43
Filter Eff. %	90	93	93	91	92	92	93

13-MODE

	Test	Test	Average
HC, g/kW-hr			
CO, g/kW-hr			
CO_2, g/kW-hr			
NOX, g/kW-hr			
SFC, kg/kW-hr			
POWER, kW			

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	2.28	(1.70)	8.14	2.63
CO,	g/kW-hr (g/hp-hr)	2.24	(1.67)	8.00	2.58
NOX,	g/kW-hr (g/hp-hr)	6.35	(4.74)	22.68	7.32
Particulate,	g/kW-hr (g/hp-hr)	0.43	(0.32)	1.54	0.50
SFC,	kg/kW-hr (lb/hp-hr)	0.280	(0.460)		323
WORK,	kW-hr (hp-hr)	11.87	(15.92)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-11. ENGINE D12 SUMMARY OF RESULTS
1979 Caterpillar 3406 DITA

ENGINE DESCRIPTION

Engine: 1979 Caterpillar 3406 DITA
Carburetor: --
Distributor: --
Rated Power: 380 @ 2100
Maximum Torque: 1260 @ 1200
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	1260 @ 1200	1276 @ 1300
Max. Engine Power, HP @ RPM	380 @ 2100	402 @ 2000
Cylinder Compression, psi min.-max. (avg.)	--	--
Idle RPM	700	700
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - 77 Baro. - 28.90

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	1011	2100	988	3100		4100	
-	-	1200	1256	2200	787	3200		4200	
-	-	1300	1276	2300		3300		4300	
400	-	1400	1268	2400		3400		4400	
500	560	1500	1238	2500		3500		4500	
600	672	1600	1216	2600		3600		4600	
700	698	1700	1183	2700		3700		4700	
800	846	1800	1145	2800		3800		4800	
900	926	1900	1103	2900		3900		4900	
1000	843	2000	1055	3000		4000		5000	

TABLE A-11 (Cont'd). ENGINE D12 SUMMARY OF RESULTS
1979 Caterpillar 3406 DITA

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D12-3	Speed	Torque	Power	Speed	Torque	Power
Standard Error	39.	6.%	5.%	29.	4.%	4.%
Slope	1.004	.963	.993	.997	.979	1.025
Corr. Coef.	.9955	.9589	.9676	.9982	.9403	.9537
Intercept	20.	-1.7	-.6	23.	-3.7	-.9
Points Used	1176	951	951	1176	1041	1041
kW-hr Dev.[c]	----------	-7.9	----------	----------	-8.3	----------
TEST D12-4						
Standard Error	41.	6.%	4.%	38.	6.%	5.%
Slope	1.003	.972	1.000	1.006	.954	.988
Corr. Coef.	.9950	.9573	.9689	.9956	.9532	.9644
Intercept	22.	-7.6	-2.1	18.	-5.2	-1.9
Points Used	1176	964	964	1176	931	931
kW-hr Dev.[c]	----------	-7.8	----------	----------	-8.0	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D12-3	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	7.49	3.45	3.55	1.73	3.20	3.12	4.52	2.83
CO, gram	41.19	18.55	17.93	14.75	30.94	15.54	18.10	14.24
CO_2, gram	2450.2	3177.0	7759.0	2005.3	2126.9	2887.8	7738.1	1997.6
NOX, gram	32.79	38.82	106.16	35.16	34.76	36.59	101.48	33.05
FUEL, kg	0.792	1.004	2.433	0.635	0.682	0.912	2.428	0.633
KW-HR	2.16	3.36	10.41	2.20	2.23	3.22	10.38	2.23
TEST D12-4								
HC, gram	7.92	4.15	3.89	2.32	3.49	3.56	4.61	2.91
CO, gram	28.07	17.95	17.40	14.05	29.60	14.29	17.76	13.16
CO_2, gram	2529.5	3181.7	7690.1	2040.5	2063.5	2747.6	7593.6	1945.5
NOX, gram	30.68	35.95	103.34	32.52	32.11	34.29	102.71	31.76
FUEL, kg	0.811	1.006	2.412	0.646	0.662	0.868	2.383	0.616
KW-HR	2.20	3.36	10.47	2.15	2.20	3.32	10.47	2.13

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: TestD12-3 = 745 mm Hg TestD12-4 = 749 mm Hg.

TABLE A-11 (Cont'd). ENGINE D12 SUMMARY OF RESULTS
1979 Caterpillar 3406 DITA

DIESEL TRANSIENT CYCLE

	Test D12-3			Test D12-4			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	0.89	0.76	0.78	1.01	0.80	0.83	0.81
CO, g/kW-hr	5.10	4.36	4.47	4.26	4.13	4.15	4.31
CO_2, g/kW-hr	849.	816.	821.	850.	792.	800.	811.
NOX, g/kW-hr	11.74	11.40	11.45	11.14	11.09	11.10	11.28
SFC, kg/kW-hr	0.268	0.258	0.259	0.268	0.250	0.253	0.256
WORK, kW-hr	18.14	18.07	18.08	18.17	18.12	18.13	18.11
POWER, kW	54.4	54.2	54.2	54.5	54.4	54.4	54.3
Particulate, g/kW-hr	0.93	0.70	0.73	0.81	0.62	0.65	0.69
Filter Eff. %	98.	97.	97.	98.	97.	97.	97.

13-MODE

	Test D12-1	Test D12-2	Average
HC, g/kW-hr	0.373	0.400	0.387
CO, g/kW-hr	3.910	4.205	4.058
CO_2, g/kW-hr			
NOX, g/kW-hr	9.718	9.620	9.669
SFC, kg/kW-hr	0.227	0.226	0.227
POWER, kW	109.8	110.0	109.9

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	0.81 (0.60)	HC	3.16	1.42
CO,	g/kW-hr (g/hp-hr)	4.31 (3.21)	CO	16.84	7.58
NOX,	g/kW-hr (g/hp-hr)	11.28 (8.41)	NOX	44.06	19.83
Particulate,	g/kW-hr (g/hp-hr)	0.69 (0.52)	Particulate	2.70	1.21
SFC,	kg/kW-hr (lb/hp-hr)	0.256 (0.421)	FUEL CONS.		450.
WORK,	kW-hr (hp-hr)	18.11 (24.29)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-12. ENGINE D13 SUMMARY OF RESULTS
1979 Caterpillar 3406 PCTA

ENGINE DESCRIPTION

Engine: 1979 Caterpillar 3406 PCTA No. 1A6877
Carburetor: -
Distributor: -
Rated Power: @ 2100
Maximum Torque: @ 1400
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	@ 1400	1188 @ 1300
Max. Engine Power, HP @ RPM	@ 2100	387 @ 2100
Cylinder Compression, psi min.-max. (avg.)	-	-
Idle RPM	600	620
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	1119	2100	967	3100		4100	
-	-	1200	1161	2200	774	3200		4200	
-	-	1300	1188	2300	454	3300		4300	
400	450	1400	1178	2400	0	3400		4400	
500	540	1500	1156	2500		3500		4500	
600	624	1600	1140	2600		3600		4600	
700	706	1700	1118	2700		3700		4700	
800	731	1800	1095	2800		3800		4800	
900	872	1900	1054	2900		3900		4900	
1000		2000	1016	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-12 (Cont'd). ENGINE D13 SUMMARY OF RESULTS
1979 Caterpillar 3406 PCTA

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D13-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	43.	9.%	7.%	41.	8.%	6.%
Slope	1.002	.948	.988	1.001	.952	.981
Corr. Coef.	.9951	.8993	.9310	.9957	.9257	.9470
Intercept	24.	-3.9	-2.9	22.	-8.6	-2.7
Points Used	1176	960	960	1176	962	962
kW-hr Dev.[c]	----------	-8.4	----------	----------	-8.8	----------
TEST D13-2						
Standard Error	39.	6.%	6.%	69.	8.%	6.%
Slope	1.005	.956	.987	1.001	.947	.981
Corr. Coef.	.9961	.9561	.9671	.9876	.9195	.9446
Intercept	22.	-1.0	-.2	20.	-6.4	-2.3
Points Used	1176	943	943	1176	962	962
kW-hr Dev.[c]	----------	-8.5	----------	----------	-8.7	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D13-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	1.54	1.63	2.48	1.93	1.33	3.42	3.56	2.89
CO, gram	20.92	7.84	7.41	10.26	16.91	9.27	8.23	10.79
CO_2, gram	2357.4	3282.0	8271.5	2015.1	2063.9	3096.9	7907.3	2024.0
NOX, gram	16.44	23.63	76.29	16.79	15.86	23.43	70.61	15.78
FUEL, kg	0.747	1.029	2.587	0.636	0.654	0.974	2.475	0.640
KW-HR	1.85	3.45	10.52	2.09	2.08	3.36	10.36	2.02
TEST D13-2								
HC, gram	2.07	3.06	2.67	1.37	2.32	3.02	3.48	3.95
CO, gram	22.86	10.55	8.94	10.53	20.23	9.31	9.55	11.91
CO_2 gram	2475.4	3302.4	8136.8	2005.2	2101.8	3012.5	8156.7	1972.7
NOX, gram	16.67	24.12	75.31	16.23	15.40	23.93	76.24	15.95
FUEL, kg	0.786	1.039	2.546	0.632	0.668	0.947	2.553	0.625
KW-HR	2.09	3.31	10.43	2.06	2.09	3.32	10.38	2.06

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: TestD13-1= 748 mm Hg TestD13-2 = 739 mm Hg.

TABLE A-12 (Cont'd). ENGINE D13 SUMMARY OF RESULTS
1979 Caterpillar 3406 PCTA

TRANSIENT CYCLE

	TEST D13-1			TEST D13-2			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	0.42	0.63	0.60	0.51	0.71	0.68	0.64
CO, g/kW-hr	2.59	2.54	2.55	2.96	2.86	2.87	2.71
CO_2, g/kW-hr	889.	847.	853.	890.	854.	859.	856.
NOX, g/kW-hr	7.45	7.05	7.11	7.40	7.37	7.37	7.24
SFC, kg/kW-hr	0.279	0.266	0.268	0.280	0.268	0.270	0.269
WORK, kW-hr	17.91	17.82	17.83	17.89	17.86	17.86	17.85
POWER, kW	53.73	53.46	53.50	53.67	53.58	53.59	53.55
Methane, g/kW-hr	0.47	0.49	0.49	0.46	0.49	0.49	0.49
	95.	97.	97.	96.	96.	96.	97.

NINE MODE

	Test D13-1	Test D13-2	Average
HC, g/kW-hr	0.229	0.228	0.229
CO, g/kW-hr	2.327	2.132	2.230
CO_2, g/kW-hr			
NOX, g/kW-hr	7.062	6.907	6.985
SFC, kg/kW-hr	0.250	0.249	0.250
POWER, kW	104.	104.	104.

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	0.64 (0.48)	HC 2.40	1.11
CO,	g/kW-hr (g/hp-hr)	2.71 (2.02)	CO 10.07	4.70
NOX,	g/kW-hr (g/hp-hr)	7.24 (5.40)	NOX 26.91	12.55
Methane	g/kW-hr (g/hp-hr)	0.49 (0.37)	Methane 1.82	0.85
SFC,	kg/kW-hr (lb/hp-hr)	0.269 (0.442)	FUEL CONS.	466.
WORK,	kW-hr (hp-hr)	17.85 (23.94)		

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE A-13. ENGINE D-14 SUMMARY OF RESULTS
1979 CUMMINS BIG CAM NTC 350

ENGINE DESCRIPTION

Engine: 1979 Cummins Big Cam NTC 350 #10527097
Carburetor: ---
Distributor: ---
Rated Power: 350 @ 2100
Maximum Torque: @ 1400
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	@ 1400	1104 @ 1500
Max. Engine Power, HP @ RPM	350 @ 2100	346 @ 2100
Cylinder Compression, psi min.-max. (avg.)	---	---
Idle RPM	600	600

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 77F Baro. - 28.82

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	595	2100	865	3100		4100	
-	-	1200	629	2200	670	3200		4200	
-	-	1300	721	2300	206	3300		4300	
400	-	1400	1096	2400	0	3400		4400	
500	445	1500	1104	2500		3500		4500	
600	571	1600	1064	2600		3600		4600	
700	571	1700	1001	2700		3700		4700	
800	568	1800	966	2800		3800		4800	
900	559	1900	933	2900		3900		4900	
1000	570	2000	901	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-13(Cont'd). ENGINE D-14 SUMMARY OF RESULTS
1979 CUMMINS BIG CAM NTC 350

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D14-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	36.	6.%	6.%	36.	5.%	4.%
Slope	.999	.955	.983	1.003	.981	1.018
Corr. Coef.	.9966	.9401	.9528	.9965	.9516	.9648
Intercept	28.	-5.8	-.5	27.	-9.0	-2.3
Points Used	1176	904	904	1176	911	911
kW-hr Dev.[c]	----------	-14.0	----------	----------	-11.2	----------
TEST D14-3						
Standard Error	38.	7.%	5.%	35.	5.%	5.%
Slope	.999	.955	.983	1.003	.981	1.018
Corr. Coef.	.9966	.9401	.9528	.9965	.9516	.9648
Intercept	28.	-5.8	-.5	27.	-9.0	-2.3
Points Used	1176	904	904	1176	911	911
kW-hr Dev.[c]	----------	-14.0	----------	----------	-11.2	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST D14-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	2.81	3.17	4.07	3.34	2.60	3.23	3.73	2.89
CO, gram	10.24	8.49	9.30	6.73	10.08	7.92	7.89	6.02
CO_2, gram	1803.2	2513.3	6790.4	1546.9	1593.1	2414.7	6771.8	1556.3
NOX, gram	13.89	20.54	91.37	13.89	15.08	23.25	100.33	13.46
FUEL, kg	0.570	0.791	2.127	0.489	0.505	0.760	2.120	0.491
KW-HR	1.44	2.43	9.20	1.50	1.57	2.55	9.41	1.51
TEST D14-3								
HC, gram	3.56	3.28	4.08	3.13	2.57	3.25	3.54	2.72
CO, gram	10.91	7.79	8.86	6.29	10.28	7.61	8.07	5.65
CO_2, gram	1909.2	2658.5	7258.8	1548.2	1572.4	2393.3	7020.4	1491.9
NOX, gram	15.73	22.77	96.09	16.17	13.58	22.50	98.46	13.52
FUEL, kg	0.605	0.808	2.273	0.489	0.498	0.754	2.198	0.471
KW-HR	1.44	2.39	9.46	1.51	1.57	2.53	9.39	1.55

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D14-2= 740 mm Hg Test D14-3= 747 mm Hg.

TABLE A-13 (Cont'd) ENGINE D-14 SUMMARY OF RESULTS
1979 CUMMINS BIG CAM NTC 350

DIESEL TRANSIENT CYCLE

	Test D14-2			Test D14-3			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	0.92	0.83	0.84	0.95	0.80	0.82	0.83
CO, g/kW-hr	2.39	2.12	2.16	2.29	2.10	2.13	2.15
CO_2, g/kW-hr	869.	820.	827.	897.	830.	840.	834.
NOX, g/kW-hr	9.59	10.11	10.04	10.18	9.84	9.89	9.97
SFC, kg/kW-hr	0.273	0.258	0.260	0.282	0.261	0.264	0.262
WORK, kW-hr	14.57	15.04	14.97	14.81	15.04	15.01	14.99
POWER, kW	43.71	45.12	44.92	44.43	45.12	45.02	44.97
Particulate, g/kW-hr	0.52	0.56	0.55	0.53	0.53	0.53	0.54
Filter Eff. %	95.	95.	95.	97.	96.	96.	96.

13-MODE

	Test D14-1	Test D14-2	Average
HC, g/kW-hr	0.514	0.498	0.506
CO, g/kW-hr	3.271	3.771	3.521
%			
NOX, g/kW-hr	10.595	10.352	10.474
SFC, kg/kW-hr	0.241	0.239	0.240
POWER, kW	98.9	99.3	99.1

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	0.83 (0.62)	HC	3.17	1.21
CO,	g/kW-hr (g/hp-hr)	2.15 (1.60)	CO	8.21	3.13
NOX,	g/kW-hr (g/hp-hr)	9.97 (7.43)	NOX	38.05	14.51
Particulate,	g/kW-hr (g/hp-hr)	0.54 (0.40)	Particulate	2.06	0.79
SFC,	kg/kW-hr (lb/hp-hr)	0.262 (0.431)	FUEL CONS.		381.
WORK,	kW-hr (hp-hr)	14.99 (20.10)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-14. ENGINE D-15 SUMMARY OF RESULTS
1979 International Harvester DT-466

ENGINE DESCRIPTION

Engine: 1979 International Harvester DT-466
Carburetor: -
Distributor: -
Rated Power: 210 @ 2600
Maximum Torque: 487 @ 1800
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	487 @ 1800	456 @ 2000
Max. Engine Power, HP @ RPM	210 @ 2600	200 @ 2600
Cylinder Compression, psi min.-max. (avg.)	-	-
Idle RPM	700	730

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 77°F Baro. - 29.24

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	316	2100	451	3100		4100	
-	-	1200	353	2200	444	3200		4200	
-	-	1300	382	2300	440	3300		4300	
400	-	1400	418	2400	432	3400		4400	
500	194	1500	426	2500	419	3500		4500	
600	216	1600	437	2600	405	3600		4600	
700	239	1700	444	2700	344	3700		4700	
800	262	1800	450	2800	198	3800		4800	
900	283	1900	452	2900	51	3900		4900	
1000	297	2000	456	3000	0	4000		5000	

VEHICLE DESCRIPTION

TABLE A-14 (Cont'd). ENGINE D-15 SUMMARY OF RESULTS
1979 International Harvester DT-466

DIESEL TRANSIENT CYCLE

	Test D15-1			Test D15-2			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.34	1.10	1.13	1.39	1.07	1.12	1.13
CO, g/kW-hr	3.38	2.77	2.77	3.52	2.66	2.78	2.78
CO_2, g/kW-hr	947.	924.	924.	957.	922.	927.	926.
NOX, g/kW-hr	8.48	7.85	7.85	8.89	7.81	7.96	7.91
SFC, kg/kW-hr	0.299	0.289	0.290	0.302	0.290	0.292	0.291
WORK, kW-hr	8.80	8.78	8.78	8.90	8.85	8.86	8.82
POWER, kW	26.40	26.34	26.35	26.70	26.55	26.57	26.46
Particulate, g/kW-hr	0.75	0.70	0.71	0.79	0.70	0.71	0.71
Filter Eff. %	95.	97.	97.	97.	97.	97.	97.

13-MODE

	Test D15-1	Test D15-2	Average
HC, g/kW-hr	0.905	0.885	0.895
CO, g/kW-hr	3.231	3.380	3.306
CO_2, g/kW-hr			
NOX, g/kW-hr	7.848	8.115	7.982
SFC, kg/kW-hr	0.260	0.264	0.262
POWER, kW	56.6	57.0	56.8

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	1.13	(0.84)	HC 3.38	0.97
CO,	g/kW-hr	(g/hp-hr)	2.78	(2.07)	CO 9.55	2.38
NOX,	g/kW-hr	(g/hp-hr)	7.91	(5.90)	NOX 27.18	6.77
Particulate,	g/kW-hr	(g/hp-hr)	0.71	(0.53)	Particulate 2.44	0.61
SFC,	kg/kW-hr	(lb/hp-hr)	0.291	(0.48)	FUEL CONS.	249.
WORK,	kW-hr	(hp-hr)	8.82	(11.83)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-14 (Cont'd). ENGINE D-15 SUMMARY OF RESULTS
1979 International Harvester DT-466

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D15-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	44.	7.%	5.%	42.	6.%	5.%
Slope	1.001	.938	.983	1.007	.940	.980
Corr. Coef.	.9968	.9498	.9650	.9971	.9616	.9710
Intercept	38.	2.0	-.5	23.	2.0	.1
Points Used	1176	983	983	1176	973	973
kW-hr Dev.[c]	----------	-10.3	----------	----------	-10.5	----------
TEST D15-2						
Standard Error	46.	7.%	5.%	53.	4.%	3.%
Slope	.993	.947	.990	.992	.955	.986
Corr. Coef.	.9964	.9416	.9607	.9960	.9516	.9674
Intercept	40.	2.0	-.7	29.	.6	-.1
Points Used	1176	982	982	1176	1052	1052
kW-hr Dev.[c]	----------	-9.2	----------	----------	-9.7	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D15-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	3.09	2.83	3.69	2.20	1.68	2.32	3.48	2.18
CO, gram	10.64	7.81	6.15	5.17	5.99	5.94	6.00	5.48
CO_2, gram	1197.9	1754.5	4402.8	977.1	1044.4	1611.7	4392.1	1025.8
NOX, gram	10.41	13.96	42.33	7.86	7.84	12.41	40.88	6.94
FUEL, kg	0.382	0.554	1.380	0.310	0.330	0.508	1.377	0.325
KW-HR	0.99	1.57	5.13	0.93	0.95	1.58	5.31	0.93
TEST D15-2								
HC, gram	3.26	3.01	3.79	2.32	1.61	2.26	3.47	2.15
CO, gram	11.24	8.17	6.47	5.44	5.33	6.42	6.41	5.41
CO_2 gram	1250.4	1788.9	4474.9	1008.5	1037.3	1641.4	4481.9	994.8
NOX, gram	11.14	15.10	43.72	9.16	8.06	12.35	40.77	7.95
FUEL, kg	0.399	0.565	1.403	0.320	0.328	0.518	1.405	0.315
KW-HR	0.95	1.60	5.40	0.95	0.93	1.58	5.38	0.95

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D15-1= 739 mm Hg Test D15-2 = 746 mm Hg.

TABLE A-15. ENGINE D-16 SUMMARY OF RESULTS
1979 Detroit Diesel 6V92TA (90 mm)

ENGINE DESCRIPTION

Engine: 1979 Detroit Diesel 6V92TA No. 6VF-253-92
Carburetor: ---
Distributor: ---
Rated Power: 335 @ 2100
Maximum Torque: 957 @ 1300
Comments: 90 mm injectors

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	957 @ 1300	921 @ 1500
Max. Engine Power, HP @ RPM	335 @ 2100	330 @ 2100
Cylinder Compression, pse min.-max. (avg.)	---	---
Idle RPM	500	500
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - 77 Baro. - 28.90

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	873	2100	820	3100		4100	
-		1200	905	2200	787	3200		4200	
-		1300	917	2300	0	3300		4300	
400	454	1400	919	2400		3400		4400	
500	528	1500	921	2500		3500		4500	
600	617	1600	915	2600		3600		4600	
700	689	1700	891	2700		3700		4700	
800	734	1800	880	2800		3800		4800	
900	814	1900	860	2900		3900		4900	
1000	856	2000	840	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-15 (Cont'd). ENGINE D-16 SUMMARY OF RESULTS
1979 Detroit Diesel 6V92TA (90 mm)

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D16-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	36.	6.%	6.%	37.	6.%	3.%
Slope	1.004	.982	1.008	1.001	.979	1.003
Corr. Coef.	.9970	.9599	.9695	.9969	.9611	.9751
Intercept	13.	3.9	1.6	14.	-5.5	-1.6
Points Used	1176	889	889	1176	945	945
kW-hr Dev.[c]	----------	-7.9	----------	----------	-7.9	----------
TEST D16-4						
Standard Error	47.	6.%	6.%	37.	6.%	4.%
Slope	1.004	.974	1.002	1.000	.964	.996
Corr. Coef.	.9950	.9587	.9700	.9968	.9647	.9796
Intercept	10.	7.3	2.0	13.	2.1	-.7
Points Used	1176	888	888	1176	943	943
kW-hr Dev.[c]	----------	-8.2	----------	----------	-7.8	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D16-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	1.96	3.26	6.56	3.24	3.26	3.67	6.59	3.16
CO, gram	8.52	8.37	11.12	16.86	21.28	12.26	11.23	17.93
CO_2, gram	1806.8	2557.9	6729.9	1668.2	1670.6	2470.5	6720.2	1692.0
NOX, gram	20.23	29.57	93.07	23.13	22.67	32.91	96.75	23.97
FUEL, kg	0.570	0.805	2.112	0.532	0.535	0.780	2.109	0.540
KW-HR	1.67	2.64	8.69	1.64	1.65	2.69	8.67	1.62
TEST D16-4								
HC, gram	1.36	2.71	5.74	2.94	1.61	2.78	5.76	2.93
CO, gram	8.52	7.88	11.79	16.20	14.15	10.67	10.43	16.80
CO_2 gram	2027.3	2592.9	6961.9	1715.8	1598.4	2426.3	6692.5	1645.1
NOX, gram	18.93	27.64	92.00	22.47	21.42	31.02	91.84	22.94
FUEL, kg	0.638	0.816	2.184	0.546	0.507	0.765	2.099	0.524
KW-HR	1.62	2.60	8.71	1.65	1.64	2.67	8.71	1.64

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D16-2 = 733 mm Hg Test D16-4 = 741 mm Hg.

TABLE A-15 (Cont'd). ENGINE D-16 SUMMARY OF RESULTS
1979 Detroit Diesel 6V92TA (90 mm)

DIESEL TRANSIENT CYCLE

	Test D-16-2			Test D16-4			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.03	1.14	1.12	0.87	0.89	0.89	1.01
CO, g/kW-hr	3.07	4.28	4.11	3.04	3.55	3.48	3.80
CO_2, g/kW-hr	872.	858.	860.	912.	844.	854.	857.
NOX, g/kW-hr	11.34	12.05	11.95	11.04	11.41	11.36	11.66
SFC, kg/kW-hr	0.275	0.271	0.272	0.287	0.266	0.269	0.271
WORK, kW-hr	14.64	14.64	14.64	14.58	14.65	14.64	14.64
POWER, kW	43.92	43.92	43.92	43.74	43.95	43.92	43.92
Particulate, g/kW-hr	0.60	0.83	0.80	0.62	0.65	0.65	0.73
Filter Eff. %	93.	93.	93.	98.	94.	95.	94.

13-MODE

	Test D16-1	Test D16-2	Average
HC, g/kW-hr	0.936	0.878	0.907
CO, g/kW-hr	3.738	4.082	3.910
NOX, g/kW-hr	11.680	11.865	11.773
SFC, kg/kW-hr	0.253	0.254	0.254
POWER, kW	85.1	85.8	85.5

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	1.01	(0.75)	HC 3.73	1.44
CO,	g/kW-hr	(g/hp-hr)	3.80	(2.83)	CO 14.02	5.40
NOX,	g/kW-hr	(g/hp-hr)	11.66	(8.69)	NOX 43.03	16.57
Particulate,	g/kW-hr	(g/hp-hr)	0.73	(0.54)	Particulate 2.69	1.04
SFC,	kg/kW-hr	(lb/hp-hr)	0.271	(0.45)	FUEL CONS.	385.
WORK,	kW-hr	(hp-hr)	14.64	(19.63)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-16. ENGINE D-17 SUMMARY OF RESULTS
1979 DETROIT DIESEL 8V-71TA

ENGINE DESCRIPTION

Engine: Detroit Diesel 8V-71TA No. 8VA-X517
Carburetor: ---
Distributor: ---
Rated Power: 350 @ 2100
Maximum Torque: 940 @ 2100
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	940 @ 2100	1002 @ 1300
Max. Engine Power, HP @ RPM	350 @ 2100	346 @ 2000
Cylinder Compression, psi min.-max. (avg.)	---	---
Idle RPM	500	520
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	957	2100	861	3100		4100	
-	-	1200	984	2200	796	3200		4200	
-	-	1300	1002	2300	0	3300		4300	
400	421	1400	1000	2400		3400		4400	
500	461	1500	1002	2500		3500		4500	
600	516	1600	985	2600		3600		4600	
700	560	1700	976	2700		3700		4700	
800	627	1800	953	2800		3800		4800	
900	758	1900	930	2900		3900		4900	
1000	910	2000	908	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-16 (Cont'd). ENGINE D-17 SUMMARY OF RESULTS
1979 DETROIT DIESEL 8V-71TA

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D17-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	37.	6.%	6.%	35.	4.%	5.%
Slope	1.001	.977	1.001	1.002	.986	1.005
Corr. Coef.	.9968	.9572	.9671	.9972	.9767	.9811
Intercept	14.	2.9	1.2	12.	2.3	1.1
Points Used	1176	873	873	1176	898	898
kW-hr Dev.[c]	----------	-10.0	----------	----------	-9.1	----------
TEST D17-2						
Standard Error	35.	5.%	6.%	34.	4.%	5.%
Slope	1.003	.970	.996	1.000	.979	1.000
Corr. Coef.	.9972	.9642	.9712	.9974	.9771	.9815
Intercept	10.	8.1	2.6	13.	3.8	1.3
Points Used	1176	874	874	1176	916	916
kW-hr Dev.[c]	----------	11.5	----------	----------	-8.9	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D17-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	1.90	2.32	4.87	2.71	1.60	2.67	5.04	2.72
CO, gram	8.92	6.98	9.18	17.61	15.35	8.31	9.29	18.27
CO_2, gram	1895.7	2692.9	7476.6	1740.4	1802.5	2738.4	7511.7	1831.2
NOX, gram	14.96	22.58	88.39	17.75	16.83	27.60	91.29	20.41
FUEL, kg	0.598	0.846	2.342	0.554	0.572	0.861	2.353	0.583
KW-HR	1.72	2.60	9.27	1.69	1.72	2.81	9.24	1.67
TEST D17-2								
HC, gram	2.66	2.54	5.00	2.66	1.73	2.61	4.93	2.65
CO, gram	8.67	6.27	8.01	16.51	18.48	7.50	8.12	16.14
CO_2 gram	1812.1	2661.2	7417.7	1701.4	1719.1	2356.6	7346.5	1612.2
NOX, gram	13.45	21.42	89.81	18.52	17.54	25.60	88.37	17.49
FUEL, kg	0.572	0.836	2.322	0.542	0.547	0.742	2.301	0.514
KW-HR	1.53	2.55	9.27	1.69	1.74	2.80	9.25	1.69

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D17-1 = 739 mm Hg Test D17-2 = 741 mm Hg.

TABLE A-16 (Cont'd). ENGINE D-17 SUMMARY OF RESULTS
1979 DETROIT DIESEL 8V-71TA

DIESEL TRANSIENT CYCLE

	Test D17-1			Test D17-2			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	0.77	0.78	0.78	0.86	0.77	0.78	0.78
CO, g/kW-hr	2.79	3.32	3.24	2.62	3.24	3.15	3.20
CO_2, g/kW-hr	903.	899.	900.	904.	842.	851.	876.
NOX, g/kW-hr	9.40	10.11	10.01	9.52	9.62	9.61	9.81
SFC, kg/kW-hr	0.284	0.283	0.283	0.284	0.265	0.268	0.276
WORK, kW-hr	15.29	15.45	15.43	15.04	15.48	15.42	15.43
POWER, kW	45.87	46.35	46.28	45.12	46.44	46.25	46.27
Particulate, g/kW-hr	0.46	0.52	0.51	0.48	0.50	0.50	0.51
Filter Eff. %	88.	94.	93.	88.	95.	94.	94.

13-MODE

	Test D17-1	Test D17-2	Average
HC, g/kW-hr	0.837	0.869	0.853
CO, g/kW-hr	4.193	4.107	4.150
NOX, g/kW-hr	11.073	11.007	11.040
SFC, kg/kW-hr	0.266	0.261	0.264
POWER, kW	90.6	90.8	90.7

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %		N.A.	
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	0.78 (0.58)	HC	2.83	1.17
CO,	g/kW-hr (g/hp-hr)	3.20 (2.39)	CO	11.59	4.79
NOX,	g/kW-hr (g/hp-hr)	9.81 (7.32)	NOX	35.55	14.70
Particulate,	g/kW-hr (g/hp-hr)	0.51 (0.38)	Particulate	1.85	0.76
SFC,	kg/kW-hr (lb/hp-hr)	0.276 (0.454)	FUEL CONS.		413.
WORK,	kW-hr (hp-hr)	15.43 (20.69)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-17. ENGINE D-18 SUMMARY OF RESULTS
1979 CUMMINS NTC-290

ENGINE DESCRIPTION

Engine: 1979 Cummins NTC-290 S/N 10665897
Carburetor: ---
Distributor: ---
Rated Power: 290 @ 1900
Maximum Torque: 947 @ 1300
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	947 @ 1300	952 @ 1300
Max. Engine Power, HP @ RPM	290 @ 1900	287 @ 1900
Cylinder Compression, psi min.-max. (avg.)	---	---
Idle RPM	500	500

POWER MAPPING (TQ in ft-lb) @ Temp. - 77 Baro. - 29.11

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	812	2100	0	3100		4100	
-	-	1200	912	2200		3200		4200	
-	-	1300	952	2300		3300		4300	
400	390	1400	938	2400		3400		4400	
500	429	1500	923	2500		3500		4500	
600	466	1600	893	2600		3600		4600	
700	520	1700	871	2700		3700		4700	
800	562	1800	834	2800		3800		4800	
900	581	1900	793	2900		3900		4900	
1000	644	2000	605	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-17 (Contd'). ENGINE D-18 SUMMARY OF RESULTS
1979 CUMMINS NTC-290

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D18-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	31.	6.%	6.%	29.	6.%	5.%
Slope	.999	.956	.984	.998	.933	.971
Corr. Coef.	.9971	.9523	.9615	.9975	.9444	.9620
Intercept	12.	1.5	.6	12.	3.0	-.3
Points Used	1176	921	921	1176	950	950
kW-hr Dev.[c]		-8.3			-7.6	
TEST D18-2						
Standard Error	32.	7.%	6.%	28.	5.%	5.%
Slope	.997	.947	.982	1.000	.931	.971
Corr. Coef.	.9969	.9279	.9510	.9976	.9604	.9731
Intercept	15.	- .2	- .6	12.	8.8	.9
Points Used	1176	929	929	1176	943	943
kW-hr Dev.[c]		-9.2			-7.3	

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D18-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	3.47	3.99	4.57	3.47	2.31	4.22	4.25	2.90
CO, gram	15.85	15.77	12.22	7.66	8.58	13.27	11.32	7.51
CO_2, gram	1533.0	2366.7	5527.2	1405.4	1391.2	2252.2	5827.9	1307.5
NOX, gram	10.56	22.60	87.31	12.74	12.74	25.10	95.00	15.45
FUEL, kg	0.490	0.750	1.735	0.446	0.441	0.713	1.828	0.415
KW-HR	1.34	2.49	7.69	1.39	1.36	2.47	7.69	1.47
TEST D18-2								
HC, gram	3.81	4.51	4.64	3.36	1.98	4.41	4.36	2.93
CO, gram	17.04	16.82	13.11	7.57	8.58	12.88	10.71	7.45
CO_2 gram	1520.1	2395.1	5833.8	1293.4	1390.8	2219.3	5653.5	1400.6
NOX, gram	10.81	22.21	86.31	13.43	12.21	24.04	93.59	14.13
FUEL, kg	0.486	0.760	1.831	0.411	0.440	0.703	1.774	0.444
KW-HR	1.28	2.43	7.67	1.39	1.43	2.46	7.66	1.50

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D18-1 = 739 mm Hg Test D18-2 = 741 mm Hg.

TABLE A-17 (Cont'd). ENGINE D-18 SUMMARY OF RESULTS
1979 CUMMINS NTC-290

DIESEL TRANSIENT CYCLE

	Test			Test			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.20	1.05	1.07	1.28	1.05	1.08	1.08
CO, g/kW-hr	3.99	3.13	3.25	4.27	3.04	3.22	3.24
CO_2, g/kW-hr	839.	829.	830.	864.	818.	825.	828.
NOX, g/kW-hr	10.32	11.41	11.25	10.39	11.04	10.95	11.10
SFC, kg/kW-hr	0.265	0.261	0.262	0.273	0.258	0.260	0.261
WORK, kW-hr	12.91	12.99	12.98	12.78	13.04	13.00	12.99
POWER, kW	38.73	38.97	38.94	38.34	39.12	39.01	38.98
Particulate, g/kW-hr	0.72	0.81	0.80	0.83	0.75	0.76	0.78
Filter Eff. %	96.	93.	93.	96.	93.	93.	93.

13-MODE

	Test D18-1	Test D18-2	Average
HC, g/kW-hr	0.464	0.439	0.452
CO, g/kW-hr	3.525	3.707	3.616
NOX, g/kW-hr	13.533	14.388	13.961
SFC, kg/kW-hr	0.243	0.241	0.242
POWER, kW	80.8	81.1	81.0

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	1.08	(0.81)	HC 4.14	1.36
CO,	g/kW-hr (g/hp-hr)	3.24	(2.42)	CO 12.41	4.09
NOX,	g/kW-hr (g/hp-hr)	11.10	(8.28)	NOX 42.53	14.00
Particulate,	g/kW-hr (g/hp-hr)	0.78	(0.58)	Particulate 2.99	0.98
SFC,	kg/kW-hr (lb/hp-hr)	0.261	(0.429)	FUEL CONS.	329.
WORK,	kW-hr (hp-hr)	12.99	(17.42)		

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-18. DIESEL ENGINE 19 SUMMARY OF RESULTS
IHC DTI-466B

ENGINE DESCRIPTION

Engine: 1980 International Harvester DTI 466B
Carburetor: -
Distributor: -
Rated Power:
Maximum Torque:
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	@ 1800	482 @ 1900
Max. Engine Power, HP @ RPM	@ 2600	214 @ 2600
Cylinder Compression, psi min.-max. (avg.)	N.A.	N.A.
Idle RPM	700	720
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	281	2100	470	3100		4100	
-	-	1200	288	2200	466	3200		4200	
-	-	1300	298	2300	463	3300		4300	
400	-	1400	360	2400	455	3400		4400	
500	-	1500	435	2500	446	3500		4500	
600	-	1600	445	2600	432	3600		4600	
700	238	1700	462	2700	342	3700		4700	
800	248	1800	475	2800	0	3800		4800	
900	253	1900	482	2900		3900		4900	
1000	270	2000	475	3000		4000		5000	

VEHICLE DESCRIPTION

N.A.

TABLE A-18 (Cont'd). DIESEL ENGINE 19 SUMMARY OF RESULTS
IHC DTI-466B

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST D19-3	Speed	Torque	Power	Speed	Torque	Power
Standard Error	41.	7.%	5.%	45.	7.%	4.%
Slope	1.000	.942	.993	.995	.973	.995
Corr. Coef.	.9971	.9445	.9675	.9966	.9410	.9558
Intercept	1.	6.8	-.2	8.	-7.1	-2.6
Points Used	1176	982	982	1176	993	993
kW-hr Dev.[c]						
TEST						
Standard Error						
Slope						
Corr. Coef.						
Intercept						
Points Used						
kW-hr Dev.[c]						

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test D19-3	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	2.97	2.53	3.10	1.96	1.14	1.79	3.01	2.03
CO, gram	11.32	6.48	5.33	3.98	4.88	4.89	5.21	3.70
CO_2, gram	1291.9	1808.1	4378.3	800.4	997.6	1547.2	4338.1	848.7
NOX, gram	12.15	17.0	44.77	7.75	8.75	13.17	42.56	6.47
FUEL, kg	0.412	0.570	1.372	0.254	0.315	0.487	1.359	0.269
KW-HR	0.91	1.70	5.75	1.01	0.96	1.71	5.75	1.00
TEST								
HC, gram								
CO, gram								
CO_2 gram								
NOX, gram								
FUEL, kg								
KW-HR								

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 19-3= 739 mm Hg Test = mm Hg.

TABLE A-18 (Cont'd). DIESEL ENGINE 19 SUMMARY OF RESULTS
IHC DTI-466B

DIESEL TRANSIENT CYCLE

	Test D19-3			Test			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	1.13	0.85	0.89				
CO, g/kW-hr	2.89	1.98	2.11				
CO_2, g/kW-hr	884.	821.	830.				
NOX, g/kW-hr	8.73	7.53	7.70				
SFC, kg/kW-hr	0.278	0.258	0.261				
WORK, kW-hr	9.37	9.42	9.42				
POWER, kW	28.11	28.26	28.24				
Particulate, g/kW-hr	0.49	0.41	0.42				
Filter Eff. %	93.	97.	96.				

13-MODE

	Test	Test	Average
HC, g/kW-hr			
CO, g/kW-hr			
CO_2, g/kW-hr			
NOX, g/kW-hr			
SFC, kg/kW-hr			
POWER, kW			

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	0.89	(0.66)	HC	3.41	0.81
CO,	g/kW-hr (g/hp-hr)	2.11	(1.57)	CO	8.08	1.93
NOX,	g/kW-hr (g/hp-hr)	7.70	(5.74)	NOX	29.50	7.04
Particulate,	g/kW-hr (g/hp-hr)	0.42	(0.31)	Particulate	1.61	0.38
SFC,	kg/kW-hr (lb/hp-hr)	0.261	(0.429)	FUEL CONS.		238.7
WORK,	kW-hr (hp-hr)	9.42	(12.63)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

TABLE A-19. DIESEL ENGINE 22 SUMMARY OF RESULTS
1979 Cummins NH-250

ENGINE DESCRIPTION

Engine: 1979 Cummins NH-250 (10601832)
Carburetor: ---
Distributor: ---
Rated Power: 250 @ 2100
Maximum Torque: 687 @ 1500
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	644 @ 1500	674 @ 1500
Max. Engine Power, HP @ RPM	225 @ 2100	232 @ 2100
Cylinder Compression, psi min.-max. (avg.)	---	---
Idle RPM	600	625

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 77 Baro. - 29.49

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	248	1100	653	2100	580	3100		4100	
-	248	1200	662	2200	563	3200		4200	
-	248	1300	667	2300	187	3300		4300	
400	248	1400	673	2400	0	3400		4400	
500	248	1500	674	2500		3500		4500	
600	487	1600	667	2600		3600		4600	
700	575	1700	649	2700		3700		4700	
800	601	1800	635	2800		3800		4800	
900	629	1900	617	2900		3900		4900	
1000	640	2000	593	3000		4000		5000	

VEHICLE DESCRIPTION

TABLE A-19 (Cont'd). DIESEL ENGINE 22 SUMMARY OF RESULTS
1979 Cummins NH-250

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST	Speed	Torque	Power	Speed	Torque	Power
Standard Error	36	7.%	6.%	35.	7.%	6.%
Slope	1.018	.924	.987	1.018	.913	.979
Corr. Coef.	.9966	.9364	.9641	.9968	.9384	.9666
Intercept	3.	9.6	-.1	5.	12.0	.3
Points Used	1176	983	983	1176	986	986
kW-hr Dev.[c]		-4.7			-4.1	
TEST						
Standard Error	31	6.%	6.%	35	8.%	6.%
Slope	1.001	.956	1.003	.998	.964	1.008
Corr. Coef.	.9974	.9557	.9741	.9966	.9392	.9633
Intercept	3.	13.1	1.4	8.	7.7	-.2
Points Used	1176	985	985	1176	986	986
kW-hr Dev.[c]		-2.0			-2.5	

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	13.71	7.89	7.85	3.95	5.18	7.56	6.78	3.62
CO, gram	18.40	21.36	41.31	7.93	9.33	18.85	34.71	7.65
CO_2, gram	1777.5	2384.1	5496.2	1409.2	1414.3	2070.4	5132.7	1321.4
NOX, gram	16.70	23.32	50.64	17.12	17.00	22.84	54.99	19.71
FUEL, kg	0.577	0.762	1.743	0.448	0.451	0.663	1.625	0.420
KW-HR	1.32	2.12	6.33	1.37	1.36	2.17	6.33	1.36
TEST								
HC, gram	14.07	7.47	7.31	3.64	7.22	7.92	6.81	4.02
CO, gram	14.44	22.90	47.10	8.39	10.60	20.15	38.88	8.17
CO_2 gram	1496.5	2370.0	5469.8	1420.0	1426.3	2170.5	5304.1	1397.8
NOX, gram	27.60	29.13	56.49	19.90	21.22	27.54	61.30	22.52
FUEL, kg	0.488	0.758	1.737	0.451	0.457	0.695	1.681	0.444
KW-HR	1.37	2.21	6.47	1.41	1.38	2.21	6.45	1.37

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test D22 = 739 mm Hg Test D22 = 739 mm Hg.

TABLE A-19 (Cont'd). DIESEL ENGINE 22 SUMMARY OF RESULTS
1979 Cummins NH-250

DIESEL TRANSIENT CYCLE

	Test			Test			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	3.00	2.06	2.19	2.83	2.28	2.36	2.28
CO, g/kW-hr	7.98	6.29	6.53	8.10	6.82	7.00	6.77
CO_2, g/kW-hr	993.	886.	901.	939.	903.	908.	905.
NOX, g/kW-hr	.67	10.20	10.12	11.62	11.62	11.62	10.87
SFC, kg/kW-hr	0.317	0.281	0.286	0.300	0.287	0.289	0.288
WORK, kW-hr	11.15	11.22	11.21	11.46	11.41	11.42	11.32
POWER, kW	33.45	33.66	33.63	34.38	34.23	34.25	33.94
Particulate, g/kW-hr	1.30	0.92	0.97	1.18	0.93	0.97	0.97
Filter Eff. %	97.	97.	97.	97.	96.	96.	97.

13-MODE

	Test D22-1	Test D22-2	Average
HC, g/kW-hr	0.560	0.452	0.506
CO, g/kW-hr	6.139	5.550	5.845
CO_2, g/kW-hr			
NOX, g/kW-hr	6.879	7.098	6.989
SFC, kg/kW-hr	0.431	0.423	0.427
POWER, kW	85.4	86.9	86.2

IDLE

	Test	Test	Average
RPM			
HC, ppmC			
CO, %			
CO_2, %			
Fuel, kg/hr			

DIESEL TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	2.28 (1.70)	HC	7.92	2.51
CO,	g/kW-hr	(g/hp-hr)	6.77 (5.05)	CO	23.51	7.44
NOX,	g/kW-hr	(g/hp-hr)	10.87 (8.11)	NOX	37.74	11.95
Particulate,	g/kW-hr	(g/hp-hr)	0.97 (0.72)	Particulate	3.37	1.07
SFC,	kg/kW-hr	(lb/hp-hr)	0.288 (0.474)	FUEL CONS.		316.5
WORK,	kW-hr	(hp-hr)	11.32 (15.18)			

[a] Using a composite value of 10.30 km for the Transient Cycle.

APPENDIX B

COMPUTER PRINTOUTS OF THE BASELINE TEST RESULTS

Table Number	Engine Number	Description
B-1	D-1	1978 Cat. 3208 DINA
B-2	D-2	1976 Cummins NTC-350
B-3	D-3	1978 DDA 6V92T
B-4	D-4	1979 Cummins NTCC-350
B-5	D-5	1978 DDA 8V-71N
B-6	D-6	1979 DDA 6V92TA
B-7	D-7	1979 IH DTI-466B
B-8	D-9	1979 Mack ETAZ
B-9	D-10	1980 Mack ETSX
B-10	D-11	1979 Cummins VTB-903
B-11	D-12	1979 Cat. 3406 DITA
B-12	D-13	1979 Cat. 3406 PCTA
B-13	D-14	1979 Cummins B.C. NTC-350
B-14	D-15	1979 IH DT-466
B-15	D-16	1979 DDA 6V-92TA (90mm)
B-16	D-17	1979 DDA 8V-71TA
B-17	D-18	1979 Cummins NTC-290
B-18	D-19	1979 IH DTI-466B (same as D-7)
B-19	D-22	1979 Cummins NT-250

TABLE B-1A. TEST D1-5 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C320R
ENGINE MODEL -0 CAT 320R
ENGINE 9.4 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-5 RUN
DATE 2/23/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 1

BAROMETER 736.09 MM HG(28.98 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 72 PCT
ABSOLUTE HUMIDITY 14.3 GM/KG(100.0 GRAINS/LB)

NOX HUMIDITY C.F. 1.1329

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)
BLOWER INLET P MM. H2O(IN. H2O)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3322	3368	3425	3334
TIME SECONDS	295.8	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	152.7 (5393)	154.8 (5467)	157.9 (5580)	153.2 (5412)
HC SAMPLE METER/RANGE/PPM	23.6/22/ 118	33.8/22/ 169	38.5/22/ 193	18.6/22/ 93
HC BCKGRD METER/RANGE/PPM	10.8/ 1/ 11	17.2/ 1/ 17	16.3/ 1/ 16	22.0/ 1/ 22
CO SAMPLE METER/RANGE/PPM	95.5/13/ 97	94.9/13/ 96	50.8/12/ 112	94.9/13/ 93
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1	1.2/13/ 1	.5/12/ 1	.9/13/ 1
CO2 SAMPLE METER/RANGE/PCT	29.9/ 3/ .98	35.2/ 3/ .59	77.9/ 3/ 1.92	24.6/ 3/ .90
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .09	2.9/ 3/ .09	3.1/ 3/ .05	3.2/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	39.9/ 2/ 98	44.9/ 2/ 94	35.9/ 3/ 106	35.1/ 2/ 95
NOX BCKGRD METER/RANGE/PPM	2.5/ 2/ 3	3.1/ 2/ 3	.7/ 3/ 2	1.9/ 2/ 2
DILUTION FACTOR	26.47	21.77	9.27	32.36
HC CONCENTRATION PPM	108	152	178	72
CO CONCENTRATION PPM	93	91	106	90
CO2 CONCENTRATION PCT	.95	.55	1.37	.35
NOX CONCENTRATION PPM	37.5	41.9	109.3	33.3
HC MASS GRAMS	9.98	13.60	16.17	6.33
CO MASS GRAMS	16.55	16.99	19.38	7.22
CO2 MASS GRAMS	1245.0	1550.7	3459.7	970.0
NOX MASS GRAMS	12.91	13.90	35.59	11.04
FUEL KG (LB)	.410 (.90)	.511 (1.13)	1.274 (2.81)	.316 (.70)
KW HR (HP HR)	1.05 (1.41)	1.49 (2.00)	5.01 (6.72)	1.04 (1.39)
BSHC G/KW HR (G/HP HR)	9.81 (6.72)	9.13 (6.81)	3.23 (2.40)	6.12 (4.56)
BSCO G/KW HR (G/HP HR)	15.74 (11.73)	11.07 (8.25)	3.86 (2.88)	6.98 (5.21)
BSCO2 G/KW HR (G/HP HR)	1183.70 (882.68)	1040.77 (776.10)	789.82 (588.97)	937.82 (699.37)
BSNOX G/KW HR (G/HP HR)	11.80 (8.80)	9.33 (6.96)	7.10 (5.29)	10.68 (7.96)
BSFC KG/KW HR (LB/HP HR)	.390 (.691)	.343 (.563)	.254 (.418)	.305 (.502)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.59	(11.52)
BSHC G/KW HR (G/HP HR)	5.31	(3.96)
BSCO G/KW HR (G/HP HR)	6.99	(5.18)
BSCO2 G/KW HR (G/HP HR)	849	(621)
BSNOX G/KW HR (G/HP HR)	8.99	(6.33)
BSFC KG/KW HR (LB/HP HR)	.292	(.490)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.993 (33.29)
MULTIPLIER FOR	G/TEST	.856
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0763 (.0569)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2612 (.1185)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

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TABLE B-1A (CONT'D). TEST D1-5 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 320R
ENGINE 9.9 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-5 RUN
DATE 2/23/79
TIME
DYNO NO. 5

DIESEL E9-273-F
BAG CART NO. 2

BAROMETER 736.09 MM HG(28.98 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 21 PCT
ABSOLUTE HUMIDITY 14.6 GM/KG(102.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.1468

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)
BLOWER INLET P MM. H2O(IN. H2O)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3323	3366	3426	3334
TIME SECONDS	295.9	299.8	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	152.7 (5394)	154.7 (5464)	157.5 (5561)	153.2 (5412)
HC SAMPLE METER/RANGE/PPM	17.0/22/ 85	25.3/22/ 126	34.9/22/ 175	18.1/22/ 90
HC BCKGRD METER/RANGE/PPM	14.9/ 1/ 15	15.1/ 1/ 15	14.1/ 1/ 14	13.5/ 1/ 13
CO SAMPLE METER/RANGE/PPM	50.3/13/ 48	59.0/13/ 56	97.9/13/ 102	43.7/13/ 41
CO BCKGRD METER/RANGE/PPM	.5/13/ 0	.9/13/ 0	.7/13/ 1	.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	25.5/ 3/ .42	32.4/ 3/ .54	77.4/ 3/ 1.41	24.5/ 3/ .40
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.1/ 3/ .05	3.3/ 3/ .05	4.8/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	36.1/ 2/ 36	34.8/ 2/ 40	35.9/ 3/ 108	34.6/ 2/ 35
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	1.2/ 2/ 1	.5/ 3/ 2	1.3/ 2/ 1
DILUTION FACTOR	31.09	24.02	9.35	32.40
HC CONCENTRATION PPM	71	112	162	77
CO CONCENTRATION PPM	46	54	92	40
CO2 CONCENTRATION PCT	.37	.49	1.36	.39
NOX CONCENTRATION PPM	39.9	38.6	106.9	33.3
HC MASS GRAMS	6.23	9.98	14.72	6.84
CO MASS GRAMS	8.16	9.77	17.74	7.06
CO2 MASS GRAMS	1048.6	1400.0	3929.7	965.1
NOX MASS GRAMS	11.71	13.12	36.74	11.21
FUEL KG (LB)	.341 (.75)	.456 (1.01)	1.261 (2.78)	.315 (.69)
KW HR (HP HR)	1.10 (1.48)	1.53 (2.05)	5.14 (6.89)	1.07 (1.43)
BSHC G/KW HR (G/HP HR)	5.69 (4.21)	6.54 (4.88)	2.82 (2.14)	6.40 (4.77)
BSCO G/KW HR (G/HP HR)	7.39 (5.51)	6.41 (4.78)	3.45 (2.58)	6.60 (4.92)
BSCO2 G/KW HR (G/HP HR)	949.50 (708.04)	918.01 (684.56)	764.15 (569.82)	902.58 (673.06)
BSNOX G/KW HR (G/HP HR)	10.60 (7.90)	8.60 (6.41)	7.15 (5.33)	10.48 (7.82)
BSFC KG/KW HR (LB/HP HR)	.309 (.507)	.299 (.492)	.245 (.404)	.294 (.484)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.915 (32.30)
MULTIPLIER FOR	G/TEST	.624
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0265 (.0570)
MULTIPLIER FOR	G/BG FUEL (G/LB FUEL)	.2899 (.1292)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		8.83 (11.85)
BSHC	G/KW HR (G/HP HR)	4.28 (3.19)
BSCO	G/KW HR (G/HP HR)	4.84 (3.61)
BSCO2	G/KW HR (G/HP HR)	831 (619)
BSNOX	G/KW HR (G/HP HR)	8.24 (6.14)
BSFC	KG/KW HR (LB/HP HR)	.269 (.441)

TABLE B-1B. TEST D1-6 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -8 CAT 3208
ENGINE 14.6 L(636 CID) V-8
CVS NO. 18

TEST NO.D1-6 RUN
DATE 2/26/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 748.03 MM HG(29.45 IN HG)
DRY BULB TEMP. 20.0 DEG C(68.0 DEG F)

RELATIVE HUMIDITY 28 PCT
ABSOLUTE HUMIDITY 4.1 GM/KG(28.7 GRAINS/LB)

NOX HUMIDITY C.F. .8212

BAG RESULTS

	1 HYSF	2 LANF	3 LAF	4 HYSF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)
BLOWER INLET P MM. H20(IN. H20)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3322	3322	3426	3334
TIME SECONDS	295.8	294.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	155.4 (5488)	155.2 (5482)	160.3 (5660)	156.0 (5508)
HC SAMPLE METER/RANGE/PPM	25.6/22/ 128	32.5/22/ 163	39.5/22/ 197	17.3/22/ 87
HC BCKGRD METER/RANGE/PPM	17.0/ 1/ 17	17.0/ 1/ 17	18.3/ 1/ 18	15.5/ 1/ 15
CO SAMPLE METER/RANGE/PPM	34.6/11/ 117	31.0/11/ 102	34.5/11/ 116	13.5/11/ 41
CO BCKGRD METER/RANGE/PPM	11.1/11/ 33	.3/11/ 1	.5/11/ 1	3.0/11/ 9
CO2 SAMPLE METER/RANGE/PCT	29.2/ 3/ .48	35.0/ 3/ .59	75.1/ 3/ 1.36	23.5/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.5/ 3/ .04	1.8/ 3/ .03	7.5/ 3/ .12
NOX SAMPLE METER/RANGE/PPM	45.2/ 2/ 45	50.9/ 2/ 51	44.8/ 3/ 134	47.2/ 2/ 47
NOx BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.5/ 2/ 1	.4/ 2/ 0	5.2/ 2/ 5
DILUTION FACTOR	26.43	21.87	9.65	33.86
HC CONCENTRATION PPM	111	146	181	72
CO CONCENTRATION PPM	83	100	111	32
CO2 CONCENTRATION PCT	.45	.55	1.33	.27
NOX CONCENTRATION PPM	44.7	50.4	134.0	42.2
HC MASS GRAMS	9.99	13.10	16.73	6.44
CO MASS GRAMS	15.03	18.00	20.70	5.76
CO2 MASS GRAMS	1264.4	1562.9	3913.4	771.0
NOX MASS GRAMS	10.92	12.29	33.24	10.34
FUEL KG (LB)	.418 (.92)	.515 (1.13)	1.261 (2.78)	.252 (.56)
KW HR (HP HR)	1.09 (1.46)	1.61 (2.16)	5.21 (6.98)	1.19 (1.60)
BSHC G/KW HR (G/HP HR)	9.19 (6.85)	8.12 (6.06)	3.21 (2.40)	5.40 (4.03)
BSCO G/KW HR (G/HP HR)	13.83 (10.31)	11.16 (8.32)	3.98 (2.96)	4.84 (3.61)
BSCO2 G/KW HR (G/HP HR)	1167.96 (870.95)	964.13 (722.68)	751.69 (560.53)	646.84 (482.35)
BSNOX G/KW HR (G/HP HR)	10.04 (7.49)	7.62 (5.68)	6.48 (4.83)	8.66 (6.46)
BSFC KG/KW HR (LB/HP HR)	.384 (.632)	.319 (.525)	.242 (.398)	.212 (.348)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.10 (12.20)
BSHC G/KW HR (G/HP HR)	5.08 (3.79)
BSCO G/KW HR (G/HP HR)	6.54 (4.88)
BSCO2 G/KW HR (G/HP HR)	826 (616)
BSNOX G/KW HR (G/HP HR)	7.39 (5.51)
BSFC KG/KW HR (LB/HP HR)	.269 (.442)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.104 (39.00)
MULTIPLIER FOR	G/TEST	.568
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0624 (.0465)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2321 (.1053)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

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TABLE B-1B (CONT'D). TEST D1-6 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5049-001

ENGINE NO.C320R
ENGINE MODEL -6 CAT 320R
ENGINE 9.4 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-6 RUN
DATE 2/26/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 747.78 MM HG(29.44 IN HG)
DRY BULB TEMP. 18.9 DEG C(66.0 DEG F)

RELATIVE HUMIDITY 29 PCT
ABSOLUTE HUMIDITY 4.0 G H2O/KG(28.1 GRAINS/LB)

NOX HUMIDITY C.F. .8194

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	HYDF	LAPF	LAF	HYDF
BLOWER DIF P MM. H2O(IN. H2O)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)	355.6 (14.0)
BLOWER INLET P MM. H2O(IN. H2O)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3323	3368	3425	3333
TIME SECONDS	295.9	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	155.9 (5488)	157.5 (5562)	160.1 (5656)	155.8 (5504)
HC SAMPLE METER/RANGE/PPM	15.7/22/ 79	25.2/22/ 126	35.8/22/ 179	16.9/22/ 85
HC BCKGRD METER/RANGE/PPM	13.8/ 1/ 14	11.3/ 1/ 11	9.8/ 1/ 10	8.6/ 1/ 9
CO SAMPLE METER/RANGE/PPM	16.9/11/ 50	19.0/11/ 59	30.6/11/ 101	13.9/11/ 40
CO BCKGRD METER/RANGE/PPM	1.0/11/ 3	.5/11/ 1	.3/11/ 1	.6/11/ 2
CO2 SAMPLE METER/RANGE/PCT	25.2/ 3/ .91	32.2/ 3/ .54	76.1/ 3/ 1.38	23.7/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.2/ 3/ .04	2.5/ 3/ .04	2.3/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	44.7/ 2/ 45	50.3/ 2/ 50	46.3/ 3/ 134	42.8/ 2/ 43
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.9/ 2/ 1	.5/ 3/ 2	2.2/ 2/ 2
DILUTION FACTOR	31.50	24.17	9.53	33.58
HC CONCENTRATION PPM	65	115	120	76
CO CONCENTRATION PPM	42	56	42	38
CO2 CONCENTRATION PCT	.38	.50	1.35	.34
NOX CONCENTRATION PPM	43.9	49.9	137.6	40.7
HC MASS GRAMS	5.85	10.96	15.79	6.86
CO MASS GRAMS	8.42	10.39	18.00	6.89
CO2 MASS GRAMS	1081.6	1440.5	3351.7	971.9
NOX MASS GRAMS	10.70	12.20	34.53	9.93
FUEL KG (LB)	.351 (.77)	.470 (1.04)	1.270 (2.80)	.317 (.70)
KW HR (HP HR)	1.10 (1.48)	1.49 (2.00)	5.19 (6.96)	1.10 (1.48)
BSHC G/KW HR (G/HP HR)	5.29 (3.95)	7.02 (5.24)	3.03 (2.26)	6.21 (4.63)
BSCO G/KW HR (G/HP HR)	7.62 (5.69)	6.99 (5.17)	3.47 (2.59)	6.24 (4.66)
BSCO2 G/KW HR (G/HP HR)	979.99 (730.39)	966.77 (720.92)	761.60 (567.93)	880.05 (656.26)
BSNOX G/KW HR (G/HP HR)	9.69 (7.22)	8.19 (6.11)	6.65 (4.96)	8.99 (6.71)
BSFC KG/KW HR (LB/HP HR)	.318 (.522)	.315 (.518)	.245 (.403)	.287 (.471)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.29 (11.92)
BSHC G/KW HR (G/HP HR)	4.38 (3.26)
BSCO G/KW HR (G/HP HR)	4.91 (3.66)
BSCO2 G/KW HR (G/HP HR)	838 (625)
BSNOX G/KW HR (G/HP HR)	7.58 (5.65)
BSFC KG/KW HR (LB/HP HR)	.271 (.445)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.069 (37.76)
MULTIPLIER FOR	G/TEST	.588
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0662 (.0494)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2993 (.1108)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-1C. TEST D1-7 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 3208
ENGINE *.4 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-7 RUN
DATE 2/27/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 739.90 MM HG(29.13 IN HG)
DRY BULB TEMP. 20.6 DEG C(69.0 DEG F)

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 7.9 GM/KG(55.1 GRAINS/LB) NOX HUMIDITY C.F. .9146

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H20(IN. H20)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3323	3368	3426	3334
TIME SECONDS	295.8	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	153.9 (5417)	155.9 (5490)	158.1 (5585)	153.9 (5435)
HC SAMPLE METER/RANGE/PPM	23.9/22/ 117	32.5/22/ 162	35.6/22/ 178	16.9/22/ 82
HC BCKGRD METER/RANGE/PPM	10.5/ 1/ 10	12.5/ 1/ 13	12.0/ 1/ 12	11.5/ 1/ 11
CO SAMPLE METER/RANGE/PPM	32.7/11/ 109	32.5/11/ 108	33.9/11/ 112	14.6/11/ 99
CO BCKGRD METER/RANGE/PPM	.1/11/ 0	.1/11/ 0	.1/11/ 0	.7/11/ 2
CO2 SAMPLE METER/RANGE/PCT	29.5/ 3/ .99	35.7/ 3/ .60	77.5/ 3/ 1.91	23.6/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .09	3.0/ 3/ .05	2.9/ 3/ .09	2.9/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	95.3/ 2/ 95	50.0/ 2/ 50	96.2/ 3/ 139	90.2/ 2/ 90
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 0	.9/ 2/ 0	.1/ 3/ 0	1.0/ 2/ 1
DILUTION FACTOR	26.25	21.91	9.33	33.72
HC CONCENTRATION PPM	107	150	168	71
CO CONCENTRATION PPM	106	105	107	91
CO2 CONCENTRATION PCT	.95	.56	1.37	.39
NOX CONCENTRATION PPM	99.9	99.6	138.3	39.2
HC MASS GRAMS	9.99	13.98	15.28	6.29
CO MASS GRAMS	18.93	19.01	19.65	7.39
CO2 MASS GRAMS	1259.5	1580.5	3963.6	963.2
NOX MASS GRAMS	12.05	13.99	38.27	10.56
FUEL KG (LB)	.916 (.92)	.521 (1.15)	1.275 (2.81)	.319 (.69)
KW HR (HP HR)	1.10 (1.48)	1.60 (2.14)	5.21 (6.98)	1.14 (1.53)
BSHC G/KW HR (G/HP HR)	8.55 (6.38)	8.45 (6.30)	2.93 (2.19)	5.52 (4.11)
BSCO G/KW HR (G/HP HR)	17.14 (12.78)	11.92 (8.89)	3.77 (2.81)	6.49 (4.84)
BSCO2 G/KW HR (G/HP HR)	1140.47 (850.45)	990.80 (738.84)	761.32 (567.71)	845.39 (630.41)
BSNOX G/KW HR (G/HP HR)	10.91 (8.14)	8.46 (6.31)	7.35 (5.48)	9.27 (6.91)
BSFC KG/KW HR (LB/HP HR)	.377 (.619)	.327 (.537)	.245 (.402)	.275 (.452)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.05	(12.13)
BSHC G/KW HR (G/HP HR)	4.92	(3.67)
BSCO G/KW HR (G/HP HR)	7.18	(5.36)
BSCO2 G/KW HR (G/HP HR)	859	(640)
BSNOX G/KW HR (G/HP HR)	8.22	(6.13)
BSFC KG/KW HR (LB/HP HR)	.279	(.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	.463	(16.35)
MULTIPLIER FOR G/TEST	1.341	
MULTIPLIER FOR G/KW HR (G/HP HR)	.1482	(.1105)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	.5310	(.2409)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00	(0.0)

TABLE B-1C (CONT'D). TEST D1-7 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 3208
ENGINE 9.4 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-7 RUN
DATE 2/27/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 20.6 DEG C(69.0 DEG F)

RELATIVE HUMIDITY 54 PCT
ABSOLUTE HUMIDITY 8.4 GM/KG(58.6 GRAINS/LB)

NOX HUMIDITY C.F. .9284

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3322	3368	3426	3333
TIME SECONDS	295.8	299.8	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	153.2 (5411)	155.3 (5486)	158.0 (5581)	153.7 (5429)
HC SAMPLE METER/RANGE/PPM	16.5/22/ 82	24.6/22/ 123	34.7/22/ 173	16.8/22/ 84
HC BCKGRD METER/RANGE/PPM	7.7/ 1/ 8	7.5/ 1/ 8	7.2/ 1/ 7	7.0/ 1/ 7
CO SAMPLE METER/RANGE/PPM	16.3/11/ 50	18.8/11/ 58	29.8/11/ 48	13.2/11/ 40
CO BCKGRD METER/RANGE/PPM	.5/11/ 1	.9/11/ 1	.3/11/ 1	.3/11/ 1
CO2 SAMPLE METER/RANGE/PCT	24.2/ 3/ .40	30.9/ 3/ .51	74.5/ 3/ 1.35	24.1/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.6/ 3/ .04	2.7/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	39.3/ 2/ 39	44.1/ 2/ 44	44.7/ 3/ 134	40.8/ 2/ 41
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.5/ 2/ 1	.1/ 3/ 0	.1/ 3/ 0
DILUTION FACTOR	32.82	25.24	9.76	33.02
HC CONCENTRATION PPM	75	116	167	77
CO CONCENTRATION PPM	47	56	93	38
CO2 CONCENTRATION PCT	.35	.47	1.31	.35
NOX CONCENTRATION PPM	38.7	43.6	133.8	40.5
HC MASS GRAMS	6.61	10.37	15.20	6.84
CO MASS GRAMS	8.42	10.04	17.09	6.78
CO2 MASS GRAMS	984.1	1350.6	3786.3	995.1
NOX MASS GRAMS	10.53	12.03	37.55	11.06
FUEL KG (LB)	.321 (.71)	.441 (.97)	1.217 (2.68)	.324 (.71)
KW HR (HP HR)	1.21 (1.62)	1.51 (2.02)	5.19 (6.96)	1.09 (1.46)
BSHC G/KW HR (G/HP HR)	5.47 (4.08)	6.88 (5.13)	2.93 (2.18)	6.29 (4.69)
BSCO G/KW HR (G/HP HR)	6.96 (5.19)	6.66 (4.97)	3.29 (2.46)	6.23 (4.65)
BSCO2 G/KW HR (G/HP HR)	813.62 (606.72)	895.91 (668.08)	729.73 (544.16)	915.61 (682.77)
BSNOX G/KW HR (G/HP HR)	8.71 (6.49)	7.98 (5.95)	7.24 (5.40)	10.17 (7.59)
BSFC KG/KW HR (LB/HP HR)	.265 (.436)	.293 (.481)	.235 (.386)	.298 (.490)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.99	(12.06)
BSHC G/KW HR (G/HP HR)	4.34	(3.24)
BSCO G/KW HR (G/HP HR)	4.71	(3.51)
BSCO2 G/KW HR (G/HP HR)	791	(590)
BSNOX G/KW HR (G/HP HR)	7.92	(5.90)
BSFC KG/KW HR (LB/HP HR)	.256	(.421)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.460	(16.26)
MULTIPLIER FOR	G/TEST	1.347	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1498	(.1117)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.5850	(.2654)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE B-1D. TEST D1-8 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 3208
ENGINE *.4 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-8 RUN
DATE 2/28/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 743.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 21.1 DEG C(70.0 DEG F)

RELATIVE HUMIDITY 43 PCT
ABSOLUTE HUMIDITY 6.9 GM/KG(48.2 GRAINS/LB)

NOX HUMIDITY C.F. .8880

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3321	3367	3426	3334
TIME SECONDS	295.8	299.8	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	154.0 (5440)	156.2 (5515)	158.9 (5612)	154.6 (5462)
HC SAMPLE METER/RANGE/PPM	20.0/22/ 100	29.1/22/ 146	32.3/22/ 161	15.8/22/ 79
HC BCKGRD METER/RANGE/PPM	5.0/ 1/ 5	5.5/ 1/ 6	5.5/ 1/ 6	6.5/ 1/ 7
CO SAMPLE METER/RANGE/PPM	30.5/11/ 101	30.6/11/ 101	31.3/11/ 104	12.9/11/ 39
CO BCKGRD METER/RANGE/PPM	.2/11/ 1	.4/11/ 1	.1/11/ 0	.1/11/ 0
CO2 SAMPLE METER/RANGE/PCT	28.7/ 3/ .47	34.2/ 3/ .57	75.4/ 3/ 1.36	22.9/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .09	2.2/ 3/ .03	2.2/ 3/ .03	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	45.4/ 2/ 45	48.8/ 2/ 49	99.4/ 3/ 133	41.4/ 2/ 41
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.2/ 2/ 0	.1/ 3/ 0	.1/ 3/ 0
DILUTION FACTOR	27.14	22.47	9.64	34.85
HC CONCENTRATION PPM	95	140	157	73
CO CONCENTRATION PPM	98	97	99	38
CO2 CONCENTRATION PCT	.44	.54	1.33	.34
NOX CONCENTRATION PPM	45.3	48.6	132.9	41.1
HC MASS GRAMS	8.46	12.63	14.35	6.49
CO MASS GRAMS	17.52	17.70	18.36	6.77
CO2 MASS GRAMS	1237.4	1543.9	3882.9	963.3
NOX MASS GRAMS	11.85	12.89	35.88	10.80
FUEL KG (LB)	.907 (.90)	.508 (1.12)	1.247 (2.75)	.314 (.69)
KW HR (HP HR)	1.16 (1.55)	1.58 (2.12)	5.24 (7.03)	1.12 (1.50)
BSHC G/KW HR (G/HP HR)	7.31 (5.45)	8.01 (5.97)	2.74 (2.04)	5.79 (4.31)
BSCO G/KW HR (G/HP HR)	15.14 (11.29)	11.22 (8.37)	3.50 (2.61)	6.03 (4.50)
BSCO2 G/KW HR (G/HP HR)	1069.52 (797.54)	978.61 (729.75)	740.74 (552.37)	858.64 (640.28)
BSNOX G/KW HR (G/HP HR)	10.24 (7.64)	8.17 (6.09)	6.85 (5.10)	9.62 (7.18)
BSFC KG/KW HR (LB/HP HR)	.352 (.579)	.322 (.529)	.238 (.391)	.279 (.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.509 (17.97)
MULTIPLIER FOR	G/TEST	1.226
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1348 (.1005)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4952 (.2246)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.10	(12.20)
BSHC G/KW HR (G/HP HR)	4.61	(3.44)
BSCO G/KW HR (G/HP HR)	6.63	(4.95)
BSCO2 G/KW HR (G/HP HR)	838	(625)
BSNOX G/KW HR (G/HP HR)	7.85	(5.85)
BSFC KG/KW HR (LB/HP HR)	.272	(.447)

TABLE B-1D (CONT'D). TEST D1-8 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 3208
ENGINE 8.9 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-8 RUN
DATE 2/28/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 743.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 39 PCT
ABSOLUTE HUMIDITY 6.6 GM/KG(46.5 GRAINS/LB) NOX HUMIDITY C.F. .8820

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3323	3367	3426	3334
TIME SECONDS	295.9	299.8	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	154.1 (5443)	156.2 (5515)	158.9 (5612)	154.6 (5461)
HC SAMPLE METER/RANGE/PPM	14.7/22/ 74	22.1/22/ 111	32.1/22/ 161	16.4/22/ 82
HC BCKGRD METER/RANGE/PPM	7.0/ 1/ 7	7.8/ 1/ 8	7.0/ 1/ 7	7.0/ 1/ 7
CO SAMPLE METER/RANGE/PPM	15.2/11/ 96	17.3/11/ 53	31.5/11/ 104	13.2/11/ 90
CO BCKGRD METER/RANGE/PPM	.3/11/ 1	.1/11/ 0	.3/11/ 1	.3/11/ 1
CO2 SAMPLE METER/RANGE/PCT	29.0/ 3/ .39	30.5/ 3/ .51	82.2/ 3/ 1.51	29.4/ 3/ .40
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.8/ 3/ .04	2.6/ 3/ .04	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	90.4/ 2/ 90	94.8/ 2/ 95	97.5/ 3/ 192	91.7/ 2/ 92
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.5/ 2/ 1	.1/ 3/ 0	.1/ 3/ 0
DILUTION FACTOR	33.19	25.66	8.73	32.62
HC CONCENTRATION PPM	67	103	154	75
CO CONCENTRATION PPM	94	52	99	38
CO2 CONCENTRATION PCT	.35	.46	1.47	.36
NOX CONCENTRATION PPM	90.0	94.3	192.2	91.4
HC MASS GRAMS	5.95	9.30	14.14	6.70
CO MASS GRAMS	7.47	9.39	18.38	6.85
CO2 MASS GRAMS	1001.2	1328.9	4288.7	1020.0
NOX MASS GRAMS	10.90	11.68	38.13	10.80
FUEL KG (LB)	.326 (.72)	.433 (.95)	1.375 (3.03)	.332 (.73)
KW HR (HP HR)	1.17 (1.57)	1.56 (2.09)	5.22 (7.01)	1.19 (1.59)
BSHC G/KW HR (G/HP HR)	5.07 (3.78)	5.96 (4.44)	2.71 (2.02)	5.88 (4.39)
BSCO G/KW HR (G/HP HR)	6.79 (5.06)	6.02 (4.49)	3.52 (2.62)	6.01 (4.48)
BSCO2 G/KW HR (G/HP HR)	852.50 (635.71)	851.79 (635.18)	821.00 (612.22)	895.21 (667.56)
BSNOX G/KW HR (G/HP HR)	8.86 (6.61)	7.48 (5.58)	7.30 (5.44)	9.48 (7.07)
BSFC KG/KW HR (LB/HP HR)	.277 (.456)	.277 (.456)	.263 (.433)	.291 (.479)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.10 (12.20)
BSHC G/KW HR (G/HP HR)	3.97 (2.96)
BSCO G/KW HR (G/HP HR)	4.68 (3.49)
BSCO2 G/KW HR (G/HP HR)	840 (626)
BSNOX G/KW HR (G/HP HR)	7.81 (5.82)
BSFC KG/KW HR (LB/HP HR)	.271 (.445)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.499 (17.63)
MULTIPLIER FOR	G/TEST	1.250
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1374 (.1024)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.5070 (.2300)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-1E. TEST D1-11 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5099-001

ENGINE NO.C32DR
ENGINE MODEL -D CAT 32DR
ENGINE 9.9 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-11 RUN
DATE 3/ 5/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 749.55 MM HG(29.51 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 23 PCT
ABSOLUTE HUMIDITY 3.7 GM/KG(26.1 GRAINS/LB) NOX HUMIDITY C.F. .8131

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	322.6 (12.7)	322.6 (12.7)	322.6 (12.7)	322.6 (12.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3266	3368	3426	3333
TIME SECONDS	298.8	299.9	305.0	296.7
TOTAL FLOW STD. CU. METRES(SCF)	153.0 (5405)	157.8 (5574)	160.5 (5670)	156.2 (5516)
HC SAMPLE METER/RANGE/PPM	22.2/22/ 111	31.7/22/ 158	40.1/22/ 201	17.2/22/ 86
HC BCKGRD METER/RANGE/PPM	4.5/ 1/ 5	5.0/ 1/ 5	5.3/ 1/ 5	4.6/ 1/ 5
CO SAMPLE METER/RANGE/PPM	32.6/11/ 109	31.9/11/ 106	33.0/11/ 110	14.1/11/ 93
CO BCKGRD METER/RANGE/PPM	.6/11/ 2	.4/11/ 1	.3/11/ 1	.4/11/ 1
CO2 SAMPLE METER/RANGE/PCT	27.3/ 3/ .95	32.0/ 3/ .53	72.3/ 3/ 1.30	22.3/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .09	2.1/ 3/ .03	2.5/ 3/ .04	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	45.1/ 2/ 45	49.2/ 2/ 49	45.8/ 3/ 137	39.2/ 2/ 39
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.1/ 3/ 0	.2/ 2/ 0
DILUTION FACTOR	28.99	23.98	10.07	35.71
HC CONCENTRATION PPM	107	154	194	81
CO CONCENTRATION PPM	105	103	106	91
CO2 CONCENTRATION PCT	.91	.50	1.27	.33
NOX CONCENTRATION PPM	45.0	49.1	137.1	39.0
HC MASS GRAMS	9.91	13.99	18.19	7.39
CO MASS GRAMS	18.77	18.93	19.80	7.93
CO2 MASS GRAMS	1160.2	1450.3	3721.1	993.3
NOX MASS GRAMS	10.71	12.05	39.29	9.98
FUEL KG (LB)	.389 (.85)	.481 (1.06)	1.201 (2.65)	.308 (.68)
KW HR (HP HR)	1.19 (1.53)	1.53 (2.05)	5.22 (7.01)	1.05 (1.41)
BSHC G/KW HR (G/HP HR)	8.26 (6.16)	9.17 (6.84)	3.97 (2.59)	6.97 (5.20)
BSCO G/KW HR (G/HP HR)	16.97 (12.28)	12.41 (9.26)	3.79 (2.83)	7.06 (5.27)
BSCO2 G/KW HR (G/HP HR)	1018.29 (759.30)	951.00 (709.16)	712.34 (531.19)	896.83 (668.77)
BSNOX G/KW HR (G/HP HR)	9.40 (7.01)	7.90 (5.89)	6.55 (4.89)	9.01 (6.72)
BSFC KG/KW HR (LB/HP HR)	.337 (.555)	.315 (.518)	.230 (.378)	.293 (.482)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.99 (11.99)
BSHC G/KW HR (G/HP HR)	5.47 (4.08)
BSCO G/KW HR (G/HP HR)	7.26 (5.42)
BSCO2 G/KW HR (G/HP HR)	814 (607)
BSNOX G/KW HR (G/HP HR)	7.44 (5.55)
BSFC KG/KW HR (LB/HP HR)	.266 (.437)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.335 (47.16)
MULTIPLIER FOR	G/TEST	.470
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0526 (.0392)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.1479 (.0898)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-1E (CONT'D). TEST D1-11 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -8 CAT 3208
ENGINE 10.4 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-11 RUN
DATE 3/ 5/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 749.55 MM HG(29.51 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 22 PCT
ABSOLUTE HUMIDITY 4.2 GM/KG(29.4 GRAINS/LB)

NOX HUMIDITY C.F. .8236

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3321	3367	3426	3332
TIME SECONDS	295.8	299.9	305.0	296.7
TOTAL FLOW STD. CU. METRES(SCF)	155.7 (5498)	157.8 (5574)	160.6 (5672)	156.2 (5516)
HC SAMPLE METER/RANGE/PPM	16.1/22/ 80	26.3/22/ 132	39.6/22/ 198	17.5/22/ 87
HC BCKGRD METER/RANGE/PPM	7.2/ 1/ 7	8.0/ 1/ 8	8.0/ 1/ 8	8.0/ 1/ 8
CO SAMPLE METER/RANGE/PPM	19.8/11/ 95	19.0/11/ 59	30.9/11/ 102	13.0/11/ 39
CO BCKGRD METER/RANGE/PPM	.6/11/ 2	.5/11/ 1	.2/11/ 1	.4/11/ 1
CO2 SAMPLE METER/RANGE/PCT	29.7/ 3/ .90	32.6/ 3/ .59	77.4/ 3/ 1.41	24.5/ 3/ .90
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .09	2.5/ 3/ .09	2.3/ 3/ .09	3.5/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	43.2/ 2/ 43	59.9/ 2/ 60	95.9/ 3/ 136	42.9/ 2/ 42
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.2/ 2/ 0	.1/ 3/ 0	.1/ 2/ 0
DILUTION FACTOR	32.18	23.83	9.33	32.44
HC CONCENTRATION PPM	73	124	191	80
CO CONCENTRATION PPM	43	56	98	37
CO2 CONCENTRATION PCT	.37	.51	1.37	.35
NOX CONCENTRATION PPM	43.0	59.7	135.9	42.3
HC MASS GRAMS	6.59	11.28	17.66	7.17
CO MASS GRAMS	7.71	10.38	18.39	6.79
CO2 MASS GRAMS	1041.8	1464.4	4043.6	996.7
NOX MASS GRAMS	10.55	14.85	34.39	10.41
FUEL KG (LB)	.339 (.75)	.478 (1.05)	1.301 (2.87)	.325 (.72)
KW HR (HP HR)	1.10 (1.48)	1.54 (2.07)	5.24 (7.03)	1.10 (1.48)
BSHC G/KW HR (G/HP HR)	5.96 (4.45)	7.31 (5.45)	3.37 (2.51)	6.49 (4.84)
BSCO G/KW HR (G/HP HR)	6.98 (5.21)	6.73 (5.02)	3.50 (2.61)	6.15 (4.59)
BSCO2 G/KW HR (G/HP HR)	943.35 (703.45)	949.32 (707.90)	771.49 (575.30)	902.50 (673.00)
BSNOX G/KW HR (G/HP HR)	9.55 (7.12)	9.62 (7.18)	6.56 (4.89)	9.43 (7.03)
BSFC KG/KW HR (LB/HP HR)	.307 (.509)	.310 (.509)	.248 (.408)	.294 (.483)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.99 (12.06)
BSHC G/KW HR (G/HP HR)	4.75 (3.54)
BSCO G/KW HR (G/HP HR)	4.81 (3.58)
BSCO2 G/KW HR (G/HP HR)	839 (626)
BSNOX G/KW HR (G/HP HR)	7.81 (5.82)
BSFC KG/KW HR (LB/HP HR)	.272 (.447)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.425 (50.34)
MULTIPLIER FOR	G/TEST	.442
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0492 (.0367)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.1810 (.0821)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-1F. TEST D1-13 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 3208
ENGINE 4.9 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-13 RUN
DATE 3/ 7/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 744.22 MM HG(29.30 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 36 PCT
ABSOLUTE HUMIDITY 5.9 GM/KG(41.4 GRAINS/LB)

NOX HUMIDITY C.F. .8637

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3322	3367	3425	3334
TIME SECONDS	295.7	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	154.4 (5453)	156.5 (5527)	159.2 (5622)	155.0 (5473)
HC SAMPLE METER/RANGE/PPM	22.2/22/ 111	32.7/22/ 164	38.9/22/ 195	17.1/22/ 86
HC BCKGRD METER/RANGE/PPM	1.6/ 1/ 2	4.1/ 1/ 4	4.4/ 1/ 5	4.0/ 1/ 4
CO SAMPLE METER/RANGE/PPM	31.8/11/ 106	31.5/11/ 104	32.0/11/ 106	13.2/11/ 40
CO BCKGRD METER/RANGE/PPM	.1/11/ 0	.6/11/ 2	.5/11/ 1	.1/11/ 0
CO2 SAMPLE METER/RANGE/PCT	28.4/ 3/ .48	34.4/ 3/ .58	77.3/ 3/ 1.40	22.3/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.1/ 3/ .03	2.2/ 3/ .03	1.4/ 3/ .02
NOX SAMPLE METER/RANGE/PPM	45.4/ 2/ 45	50.6/ 2/ 51	50.0/ 3/ 150	32.6/ 2/ 33
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	.2/ 3/ 1	.3/ 2/ 0
DILUTION FACTOR	26.86	21.93	9.35	35.74
HC CONCENTRATION PPM	109	160	190	82
CO CONCENTRATION PPM	103	100	101	34
CO2 CONCENTRATION PCT	.44	.55	1.37	.34
NOX CONCENTRATION PPM	45.2	50.3	149.5	32.3
HC MASS GRAMS	9.73	14.42	17.46	7.31
CO MASS GRAMS	18.54	18.30	18.72	6.97
CO2 MASS GRAMS	1254.6	1587.5	4005.8	969.7
NOX MASS GRAMS	11.53	13.01	39.31	8.27
FUEL KG (LB)	.414 (.91)	.524 (1.16)	1.290 (2.84)	.316 (.70)
KW HR (HP HR)	1.21 (1.62)	1.63 (2.19)	5.19 (6.96)	1.12 (1.50)
BSHC G/KW HR (G/HP HR)	8.04 (6.00)	8.85 (6.60)	3.36 (2.51)	6.51 (4.86)
BSCO G/KW HR (G/HP HR)	15.33 (11.43)	11.22 (8.37)	3.61 (2.69)	6.21 (4.63)
BSCO2 G/KW HR (G/HP HR)	1037.27 (773.49)	973.78 (726.15)	772.02 (575.69)	869.39 (648.57)
BSNOX G/KW HR (G/HP HR)	9.53 (7.11)	7.98 (5.95)	7.58 (5.65)	7.37 (5.50)
BSFC KG/KW HR (LB/HP HR)	.343 (.563)	.321 (.528)	.249 (.409)	.282 (.464)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.15 (12.27)
BSHC G/KW HR (G/HP HR)	5.35 (3.99)
BSCO G/KW HR (G/HP HR)	6.83 (5.10)
BSCO2 G/KW HR (G/HP HR)	854 (637)
BSNOX G/KW HR (G/HP HR)	7.88 (5.88)
BSFC KG/KW HR (LB/HP HR)	.378 (.457)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.889 (31.39)
MULTIPLIER FOR	G/TEST	.203
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0769 (.0573)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2764 (.1254)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-1F (CONT'D). TEST D1-13 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 3208
ENGINE *.* L(636 CID) V-8
CVS NO. 10

TEST NO.D1-13 RUN
DATE 3/ 7/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 743.97 MM HG(29.29 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 32 PCT
ABSOLUTE HUMIDITY 5.8 GM/KG(40.9 GRAINS/LB)

NOX HUMIDITY C.F. .8618

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3322	3367	3426	3334
TIME SECONDS	295.8	299.8	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	154.4 (5452)	156.4 (5526)	159.2 (5622)	154.4 (5471)
HC SAMPLE METER/RANGE/PPM	21.8/22/ 109	25.1/22/ 126	37.0/22/ 185	16.7/22/ 83
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5	7.0/ 1/ 7	6.9/ 1/ 7	7.0/ 1/ 7
CO SAMPLE METER/RANGE/PPM	15.9/11/ 98	18.8/11/ 58	31.2/11/ 103	12.9/11/ 37
CO BCKGRD METER/RANGE/PPM	.3/11/ 1	.5/11/ 1	.3/11/ 1	.1/11/ 0
CO2 SAMPLE METER/RANGE/PCT	24.9/ 3/ .91	31.6/ 3/ .53	77.0/ 3/ 1.90	23.9/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .09	2.1/ 3/ .03	2.0/ 3/ .03	2.0/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	42.7/ 2/ 93	47.2/ 2/ 47	98.8/ 3/ 196	41.3/ 2/ 91
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.1/ 2/ 0	.1/ 3/ 0	.3/ 2/ 0
DILUTION FACTOR	31.67	29.65	9.90	39.06
HC CONCENTRATION PPM	104	119	179	77
CO CONCENTRATION PPM	97	56	99	36
CO2 CONCENTRATION PCT	.37	.49	1.37	.35
NOX CONCENTRATION PPM	42.5	47.1	196.1	41.0
HC MASS GRAMS	9.29	10.73	16.90	6.85
CO MASS GRAMS	8.90	10.14	18.29	6.52
CO2 MASS GRAMS	1055.5	1417.2	3995.5	998.1
NOX MASS GRAMS	10.82	12.15	38.35	10.47
FUEL KG (LB)	.346 (.76)	.463 (1.02)	1.285 (2.83)	.325 (.72)
KW HR (HP HR)	1.21 (1.62)	1.58 (2.12)	5.17 (6.93)	1.16 (1.55)
BSHC G/KW HR (G/HP HR)	7.64 (5.70)	6.80 (5.07)	3.17 (2.37)	5.92 (4.41)
BSCO G/KW HR (G/HP HR)	6.95 (5.18)	6.43 (4.79)	3.59 (2.68)	5.64 (4.20)
BSCO2 G/KW HR (G/HP HR)	872.68 (650.76)	898.33 (669.88)	772.65 (576.17)	862.68 (643.30)
BSNOX G/KW HR (G/HP HR)	8.94 (6.67)	7.70 (5.74)	7.42 (5.53)	9.05 (6.75)
BSFC KG/KW HR (LB/HP HR)	.286 (.470)	.293 (.482)	.248 (.409)	.281 (.461)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.12 (	12.22)
BSHC G/KW HR (G/HP HR)	4.74 (	3.54)
BSCO G/KW HR (G/HP HR)	4.76 (	3.55)
BSCO2 G/KW HR (G/HP HR)	819 (	611)
BSNOX G/KW HR (G/HP HR)	7.88 (	5.87)
BSFC KG/KW HR (LB/HP HR)	.265 (	.436)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.957 (33.80)
MULTIPLIER FOR	G/TEST	.653
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0716 (.0534)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2700 (.1225)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-1G. TEST D1-14 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C3208
ENGINE MODEL -0 CAT 3208
ENGINE 9.9 L(636 CID) V-8
CVS NO. 10

TEST NO.D1-14 RUN
DATE 3/ 8/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 740.66 MM HG(29.16 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 35 PCT
ABSOLUTE HUMIDITY 6.1 GM/KG(42.8 GRAINS/LB)

NOX HUMIDITY C.F. .8686

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)	320.0 (12.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3320	3368	3426	3334
TIME SECONDS	295.7	299.8	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	153.5 (5422)	155.7 (5500)	158.9 (5595)	154.2 (5445)
HC SAMPLE METER/RANGE/PPM	21.7/22/ 109	31.8/22/ 159	38.6/22/ 193	17.4/22/ 87
HC BCKGRD METER/RANGE/PPM	5.4/ 1/ 5	6.8/ 1/ 7	7.5/ 1/ 8	6.8/ 1/ 7
CO SAMPLE METER/RANGE/PPM	30.9/11/ 102	30.2/11/ 99	32.9/11/ 108	12.7/11/ 38
CO BCKGRD METER/RANGE/PPM	.3/11/ 1	.4/11/ 1	.5/11/ 1	.1/11/ 0
CO2 SAMPLE METER/RANGE/PCT	29.7/ 3/ .99	36.1/ 3/ .61	76.3/ 3/ 1.38	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .09	2.7/ 3/ .09	2.5/ 3/ .09	2.3/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	46.2/ 2/ 46	51.3/ 2/ 51	45.1/ 3/ 135	35.9/ 2/ 36
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 0	.5/ 2/ 1	.1/ 3/ 0	.1/ 2/ 0
DILUTION FACTOR	26.15	21.21	9.48	36.76
HC CONCENTRATION PPM	103	153	186	80
CO CONCENTRATION PPM	99	96	103	37
CO2 CONCENTRATION PCT	.95	.57	1.35	.32
NOX CONCENTRATION PPM	45.8	50.8	135.0	35.8
HC MASS GRAMS	9.15	13.70	17.01	7.13
CO MASS GRAMS	17.73	17.42	18.92	6.66
CO2 MASS GRAMS	1266.3	1616.7	3913.2	897.7
NOX MASS GRAMS	11.69	13.15	35.54	9.17
FUEL KG (LB)	.917 (.92)	.532 (1.17)	1.260 (2.78)	.293 (.65)
KW HR (HP HR)	1.07 (1.43)	1.61 (2.16)	5.21 (6.98)	1.10 (1.48)
BSHC G/KW HR (G/HP HR)	8.56 (6.38)	8.49 (6.33)	3.27 (2.44)	6.46 (4.82)
BSCO G/KW HR (G/HP HR)	16.58 (12.36)	10.80 (8.05)	3.63 (2.71)	6.03 (4.50)
BSCO2 G/KW HR (G/HP HR)	1184.26 (883.11)	1002.45 (747.53)	751.65 (560.50)	812.83 (606.13)
BSNOX G/KW HR (G/HP HR)	10.93 (8.15)	8.15 (6.08)	6.83 (5.09)	8.30 (6.19)
BSFC KG/KW HR (LB/HP HR)	.390 (.691)	.330 (.542)	.242 (.398)	.266 (.437)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.99	(12.06)
BSHC G/KW HR (G/HP HR)	5.23	(3.90)
BSCO G/KW HR (G/HP HR)	6.75	(5.04)
BSCO2 G/KW HR (G/HP HR)	856	(638)
BSNOX G/KW HR (G/HP HR)	7.73	(5.77)
BSFC KG/KW HR (LB/HP HR)	.278	(.457)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	.886	(31.29)
MULTIPLIER FOR	G/TEST	.702	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0781	(.0582)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2805	(.1272)
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE B-1G (CONT'D). TEST D1-14 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D1-14 RUN
DATE 3/ 8/79
TIME
DYNO NO. 5

DIESEL LM-273-F
BAG CART NO. 2

RELATIVE HUMIDITY 35 PCT
ABSOLUTE HUMIDITY 6.0 GM/KG(41.7 GRAINS/LB)

NOX HUMIDITY C.F. .8648

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)	358.1 (14.1)
BLOWER INLET P MM. H2O(IN. H2O)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)	317.5 (12.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3320	3368	3426	3334
TIME SECONDS	295.8	299.8	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	153.5 (5423)	155.8 (5502)	158.5 (5596)	154.2 (5446)
HC SAMPLE METER/RANGE/PPM	15.2/22/ 76	25.6/22/ 128	37.9/22/ 190	17.8/22/ 89
HC BCKGRD METER/RANGE/PPM	8.2/ 1/ 8	9.2/ 1/ 9	8.8/ 1/ 9	8.2/ 1/ 8
CO SAMPLE METER/RANGE/PPM	15.0/11/ 45	19.1/11/ 59	31.6/11/ 105	13.4/11/ 40
CO BCKGRD METER/RANGE/PPM	.2/11/ 1	.4/11/ 1	.3/11/ 1	.3/11/ 1
CO2 SAMPLE METER/RANGE/PCT	24.5/ 3/ .40	32.2/ 3/ .59	77.8/ 3/ 1.41	23.8/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.5/ 3/ .04	2.4/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	39.8/ 2/ 40	46.0/ 2/ 46	96.2/ 3/ 139	36.4/ 2/ 37
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	.1/ 3/ 0	.1/ 2/ 0
DILUTION FACTOR	32.48	29.16	9.28	33.40
HC CONCENTRATION PPM	68	119	182	81
CO CONCENTRATION PPM	44	57	100	39
CO2 CONCENTRATION PCT	.36	.50	1.38	.35
NOX CONCENTRATION PPM	39.6	45.7	138.3	36.8
HC MASS GRAMS	6.02	10.71	16.61	7.19
CO MASS GRAMS	7.88	10.31	18.45	6.95
CO2 MASS GRAMS	1026.2	1424.9	4010.3	992.0
NOX MASS GRAMS	10.06	11.78	36.26	9.39
FUEL KG (LB)	.333 (.74)	.465 (1.03)	1.290 (2.84)	.323 (.71)
KW HR (HP HR)	1.14 (1.53)	1.54 (2.07)	5.22 (7.01)	1.09 (1.46)
BSHC G/KW HR (G/HP HR)	5.28 (3.94)	6.94 (5.18)	3.18 (2.37)	6.61 (4.93)
BSCO G/KW HR (G/HP HR)	6.92 (5.16)	6.69 (4.99)	3.53 (2.63)	6.90 (4.77)
BSCO2 G/KW HR (G/HP HR)	900.60 (671.58)	923.73 (688.82)	767.70 (572.47)	912.73 (680.62)
BSNOX G/KW HR (G/HP HR)	8.83 (6.58)	7.64 (5.69)	6.94 (5.18)	8.64 (6.44)
BSFC KG/KW HR (LB/HP HR)	.293 (.481)	.301 (.496)	.247 (.406)	.298 (.489)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		8.99 (12.06)
BSHC	G/KW HR (G/HP HR)	4.51 (3.36)
BSCO	G/KW HR (G/HP HR)	4.85 (3.62)
BSCO2	G/KW HR (G/HP HR)	829 (618)
BSNOX	G/KW HR (G/HP HR)	7.50 (5.60)
BSFC	KG/KW HR (LB/HP HR)	.268 (.441)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.895 (31.62)
MULTIPLIER FOR	G/TEST	.695
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0773 (.0576)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2880 (.1307)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-2A. TEST D2-12 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL -0 CUM 350
ENGINE 4.0 L(855 CID) V-8
CVS NO. 10

TEST NO.D2-12 RUN
DATE 4/-0/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 738.38 MM HG(29.07 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 26 PCT
ABSOLUTE HUMIDITY 4.7 GM/KG(33.2 GRAINS/LB)

NOX HUMIDITY C.F. .8358

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6267	6367	6204
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	266.3 (9406)	270.0 (9536)	274.3 (9687)	267.3 (9440)
HC SAMPLE METER/RANGE/PPM	7.7/22/ 38	9.5/22/ 48	11.6/22/ 58	4.3/22/ 22
HC BCKGRD METER/RANGE/PPM	6.0/ 1/ 6	6.5/ 1/ 7	6.5/ 1/ 7	6.0/ 1/ 6
CO SAMPLE METER/RANGE/PPM	23.0/11/ 73	36.1/11/ 123	31.8/11/ 106	20.0/11/ 62
CO BCKGRD METER/RANGE/PPM	.1/11/ 0	.1/11/ 0	.4/11/ 1	.2/11/ 1
CO2 SAMPLE METER/RANGE/PCT	28.5/ 3/ .47	39.7/ 3/ .67	82.6/ 3/ 1.52	23.6/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	2.6/ 3/ .04	2.8/ 3/ .04	2.1/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	37.2/ 2/ 37	61.6/ 2/ 62	71.2/ 3/ 214	38.7/ 2/ 39
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.1/ 3/ 0	.1/ 2/ 0
DILUTION FACTOR	27.83	19.46	8.74	34.08
HC CONCENTRATION PPM	33	41	52	16
CO CONCENTRATION PPM	71	120	101	61
CO2 CONCENTRATION PCT	.42	.63	1.48	.35
NOX CONCENTRATION PPM	37.1	61.5	213.3	38.6
HC MASS GRAMS	5.01	6.44	8.28	2.43
CO MASS GRAMS	22.10	37.67	32.13	18.91
CO2 MASS GRAMS	2071.3	3134.6	7433.0	1731.6
NOX MASS GRAMS	15.80	26.55	93.55	16.50
FUEL KG (LB)	.669 (1.47)	1.013 (2.23)	2.367 (5.22)	.558 (1.23)
KW HR (HP HR)	1.68 (2.26)	3.12 (4.18)	9.69 (13.00)	1.67 (2.23)
BSHC G/KW HR (G/HP HR)	2.98 (2.22)	2.06 (1.54)	.85 (.64)	1.46 (1.09)
BSCO G/KW HR (G/HP HR)	13.13 (9.79)	12.07 (9.00)	3.31 (2.47)	11.36 (8.47)
BSCO2 G/KW HR (G/HP HR)	1230.87 (917.86)	1009.60 (749.13)	766.79 (571.79)	1039.82 (775.39)
BSNOX G/KW HR (G/HP HR)	9.39 (7.00)	8.51 (6.34)	9.65 (7.20)	9.91 (7.39)
BSFC KG/KW HR (LB/HP HR)	.398 (.653)	.325 (.534)	.244 (.401)	.335 (.551)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	16.16 (21.67)
BSHC G/KW HR (G/HP HR)	1.37 (1.02)
BSCO G/KW HR (G/HP HR)	6.86 (5.11)
BSCO2 G/KW HR (G/HP HR)	889 (663)
BSNOX G/KW HR (G/HP HR)	9.43 (7.03)
BSFC KG/KW HR (LB/HP HR)	.285 (.469)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.928 (32.79)
MULTIPLIER FOR	G/TEST	1.161
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0718 (.0536)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2520 (.1143)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-2A (CONT'D). TEST D2-12 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D2-12 RUN
DATE 4/-0/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

RELATIVE HUMIDITY 25 PCT
ABSOLUTE HUMIDITY 5.0 GM/KG(35.0 GRAINS/LB) NOX HUMIDITY C.F. .8418

ENGINE NO.C350
ENGINE MODEL -0 CUM 350
ENGINE *.0 L(855 CID) V-8
CVS NO. 10

BAROMETER 738.12 MM HG(29.06 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6266	6378	6204
TIME SECONDS	297.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	266.2 (9401)	269.8 (9531)	274.7 (9702)	267.2 (9436)
HC SAMPLE METER/RANGE/PPM	4.4/22/ 22	6.6/22/ 33	7.4/22/ 37	4.7/22/ 23
HC BCKGRD METER/RANGE/PPM	6.2/ 1/ 6	6.2/ 1/ 6	6.5/ 1/ 7	6.5/ 1/ 7
CO SAMPLE METER/RANGE/PPM	22.8/11/ 72	31.2/11/ 103	28.3/11/ 92	20.1/11/ 63
CO BCKGRD METER/RANGE/PPM	.5/11/ 1	.2/11/ 1	.2/11/ 1	.3/11/ 1
CO2 SAMPLE METER/RANGE/PCT	29.3/ 3/ .90	36.3/ 3/ .61	81.6/ 3/ 1.50	23.3/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.7/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	36.6/ 2/ 37	63.7/ 2/ 64	60.3/ 3/ 181	38.4/ 2/ 38
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.2/ 2/ 0	.1/ 3/ 0	.2/ 2/ 0
DILUTION FACTOR	32.98	21.50	8.88	34.52
HC CONCENTRATION PPM	16	27	31	17
CO CONCENTRATION PPM	70	101	88	61
CO2 CONCENTRATION PCT	.36	.57	1.46	.34
NOX CONCENTRATION PPM	36.4	63.5	180.6	38.2
HC MASS GRAMS	2.46	4.23	4.96	2.61
CO MASS GRAMS	21.58	31.63	28.29	18.94
CO2 MASS GRAMS	1769.1	2819.0	7348.0	1676.2
NOX MASS GRAMS	15.60	27.60	79.90	16.44
FUEL KG (LB)	.571 (1.26)	.909 (2.00)	2.335 (5.15)	.540 (1.19)
KW HR (HP HR)	1.65 (2.21)	2.98 (4.00)	9.57 (12.83)	1.61 (2.16)
BSHC G/KW HR (G/HP HR)	1.50 (1.11)	1.42 (1.06)	.52 (.39)	1.62 (1.21)
BSCO G/KW HR (G/HP HR)	13.09 (9.76)	10.61 (7.92)	2.95 (2.20)	11.74 (8.76)
BSCO2 G/KW HR (G/HP HR)	1073.67 (800.63)	945.98 (705.41)	767.73 (572.49)	1039.39 (775.08)
BSNOX G/KW HR (G/HP HR)	9.47 (7.06)	9.26 (6.91)	8.35 (6.23)	10.14 (7.60)
BSFC KG/KW HR (LB/HP HR)	.346 (.570)	.305 (.501)	.294 (.401)	.335 (.551)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.81 (21.20)
BSHC G/KW HR (G/HP HR)	.90 (.67)
BSCO G/KW HR (G/HP HR)	6.35 (4.73)
BSCO2 G/KW HR (G/HP HR)	861 (642)
BSNOX G/KW HR (G/HP HR)	8.83 (6.58)
BSFC KG/KW HR (LB/HP HR)	.275 (.453)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.932 (32.93)
MULTIPLIER FOR	G/TEST	1.156
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0731 (.0545)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2655 (.1204)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-2B. TEST D2-13 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL -8 CUM 350
ENGINE 5.0 L(855 CID) V-8
CVS NO. 10

TEST NO.D2-13 RUN
DATE 4/16/79
TIME 09:50
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 742.19 MM HG(29.22 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 82 PCT
ABSOLUTE HUMIDITY 15.1 GM/KG(105.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.1691

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6269	6375	6202
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	267.8 (9460)	271.6 (9592)	276.2 (9755)	268.7 (9490)
HC SAMPLE METER/RANGE/PPM	8.5/22/ 43	10.2/22/ 51	11.5/22/ 58	4.5/22/ 23
HC BCKGRD METER/RANGE/PPM	7.5/ 1/ 8	10.5/ 1/ 10	10.6/ 1/ 11	10.0/ 1/ 10
CO SAMPLE METER/RANGE/PPM	27.1/11/ 88	38.9/11/ 134	34.6/11/ 117	21.3/11/ 67
CO BCKGRD METER/RANGE/PPM	.1/11/ 0	.6/11/ 2	.7/11/ 2	.4/11/ 1
CO2 SAMPLE METER/RANGE/PCT	28.2/ 3/ .47	38.7/ 3/ .65	82.0/ 3/ 1.50	22.5/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.0/ 3/ .03	1.7/ 3/ .03	1.6/ 3/ .02	1.1/ 3/ .02
NOX SAMPLE METER/RANGE/PPM	33.8/ 2/ 34	50.9/ 2/ 51	62.3/ 3/ 187	34.5/ 2/ 34
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.2/ 2/ 0	.1/ 3/ 0	.3/ 2/ 0
DILUTION FACTOR	28.04	19.96	8.81	35.77
HC CONCENTRATION PPM	35	41	48	13
CO CONCENTRATION PPM	84	128	108	64
CO2 CONCENTRATION PCT	.44	.63	1.48	.35
NOX CONCENTRATION PPM	33.5	50.7	186.6	34.2
HC MASS GRAMS	5.46	6.45	7.68	1.99
CO MASS GRAMS	26.30	40.32	34.89	19.87
CO2 MASS GRAMS	2137.5	3127.5	7501.1	1720.3
NOX MASS GRAMS	20.07	30.80	115.28	20.55
FUEL KG (LB)	.692 (1.53)	1.012 (2.23)	2.390 (5.27)	.554 (1.22)
KW HR (HP HR)	1.67 (2.23)	3.02 (4.04)	9.73 (13.05)	1.70 (2.28)
BSHC G/KW HR (G/HP HR)	3.28 (2.44)	2.14 (1.59)	.79 (.59)	1.17 (.87)
BSCO G/KW HR (G/HP HR)	15.79 (11.78)	13.37 (9.97)	3.59 (2.67)	11.69 (8.71)
BSCO2 G/KW HR (G/HP HR)	1283.58 (957.16)	1037.29 (773.51)	771.02 (574.95)	1011.74 (754.45)
BSNOX G/KW HR (G/HP HR)	12.05 (8.99)	10.22 (7.62)	11.85 (8.84)	12.09 (9.01)
BSFC KG/KW HR (LB/HP HR)	.416 (.683)	.336 (.552)	.246 (.404)	.326 (.536)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	16.11 (21.60)
BSHC G/KW HR (G/HP HR)	1.34 (1.00)
BSCO G/KW HR (G/HP HR)	7.53 (5.62)
BSCO2 G/KW HR (G/HP HR)	899 (671)
BSNOX G/KW HR (G/HP HR)	11.59 (8.64)
BSFC KG/KW HR (LB/HP HR)	.289 (.474)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.926 (32.70)
MULTIPLIER FOR	G/TEST	1.171
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0727 (.0542)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2519 (.1143)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-2B (CONT'D). TEST D2-13 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL -0 CUM 350
ENGINE 4.0 L(855 CID) V-8
CVS NO. 10

TEST NO.D2-13 RUN
DATE 4/16/79
TIME 10:30
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 741.93 MM HG(29.21 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 81 PCT
ABSOLUTE HUMIDITY 16.1 GM/KG(112.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.2147

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6184	6265	6375	6209
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	267.8 (9458)	271.3 (9582)	276.1 (9751)	268.7 (9489)
HC SAMPLE METER/RANGE/PPM	5.1/22/ 26	7.1/22/ 36	7.9/22/ 39	4.9/22/ 25
HC BCKGRD METER/RANGE/PPM	10.5/ 1/ 10	10.8/ 1/ 11	11.0/ 1/ 11	11.0/ 1/ 11
CO SAMPLE METER/RANGE/PPM	24.8/11/ 79	33.2/11/ 111	32.1/11/ 107	21.0/11/ 66
CO BCKGRD METER/RANGE/PPM	.4/11/ 1	.2/11/ 1	.6/11/ 2	.6/11/ 2
CO2 SAMPLE METER/RANGE/PCT	24.9/ 3/ .41	37.3/ 3/ .63	82.6/ 3/ 1.52	23.6/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.3/ 3/ .04	2.0/ 3/ .03	2.0/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	33.7/ 2/ 34	59.2/ 2/ 59	65.2/ 3/ 196	35.5/ 2/ 35
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.5/ 2/ 1	0.0/ 3/ 0	.5/ 2/ 1
DILUTION FACTOR	32.09	20.87	8.75	34.04
HC CONCENTRATION PPM	15	25	30	14
CO CONCENTRATION PPM	75	106	99	62
CO2 CONCENTRATION PCT	.37	.59	1.49	.36
NOX CONCENTRATION PPM	33.3	58.7	195.6	35.0
HC MASS GRAMS	2.37	3.95	4.73	2.18
CO MASS GRAMS	23.54	33.58	31.94	19.38
CO2 MASS GRAMS	1823.9	2953.8	7536.8	1748.0
NOX MASS GRAMS	20.73	37.02	125.47	21.86
FUEL KG (LB)	.589 (1.30)	.952 (2.10)	2.396 (5.28)	.563 (1.24)
KW HR (HP HR)	1.70 (2.28)	3.02 (4.04)	9.69 (13.00)	1.70 (2.28)
BSHC G/KW HR (G/HP HR)	1.40 (1.04)	1.31 (.98)	.44 (.36)	1.28 (.96)
BSCO G/KW HR (G/HP HR)	13.85 (10.33)	11.14 (8.30)	3.30 (2.46)	11.40 (8.50)
BSCO2 G/KW HR (G/HP HR)	1072.67 (799.89)	979.69 (730.55)	777.49 (579.79)	1028.00 (766.58)
BSNOX G/KW HR (G/HP HR)	12.19 (9.09)	12.28 (9.16)	12.94 (9.65)	12.85 (9.59)
BSFC KG/KW HR (LB/HP HR)	.346 (.569)	.316 (.519)	.247 (.406)	.331 (.544)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	16.11 (	21.60)
BSHC G/KW HR (G/HP HR)	.82 (	.61)
BSCO G/KW HR (G/HP HR)	6.73 (	5.02)
BSCO2 G/KW HR (G/HP HR)	873 (	651)
BSNOX G/KW HR (G/HP HR)	12.73 (	9.49)
BSFC KG/KW HR (LB/HP HR)	.279 (	.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	.909 (	32.10)
MULTIPLIER FOR G/TEST	1.193	
MULTIPLIER FOR G/KW HR (G/HP HR)	.0740 (	.0552)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	.2650 (	.1202)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00 (	0.0)

TABLE B-2C. TEST D2-15 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL -0 CUM 350
ENGINE *.0 L(855 CID) V-8
CVS NO. 10

TEST NO.D2-15 RUN
DATE 4/19/79
TIME 09:30 — DIESEL EM-273-F
DYNO NO. 5 — BAG CART NO. 2

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 85 PCT
ABSOLUTE HUMIDITY 16.3 GM/KG(114.2 GRAINS/LB) — NOX HUMIDITY C.F. 1.2258

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6161	6265	6375	6202
TIME SECONDS	295.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	266.5 (9411)	271.0 (9570)	275.7 (9734)	268.2 (9474)
HC SAMPLE METER/RANGE/PPM	8.2/22/ 41	10.7/22/ 54	11.7/22/ 58	5.2/22/ 26
HC BCKGRD METER/RANGE/PPM	11.0/ 1/ 11	11.0/ 1/ 11	11.4/ 1/ 11	11.4/ 1/ 11
CO SAMPLE METER/RANGE/PPM	26.7/11/ 86	39.7/11/ 138	34.7/11/ 117	21.7/11/ 68
CO BCKGRD METER/RANGE/PPM	.5/11/ 1	.6/11/ 2	.5/11/ 1	.4/11/ 1
CO2 SAMPLE METER/RANGE/PCT	29.2/ 3/ .48	38.6/ 3/ .65	82.6/ 3/ 1.52	22.8/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.2/ 3/ .03	1.7/ 3/ .03	1.3/ 3/ .02
NOX SAMPLE METER/RANGE/PPM	33.7/ 2/ 34	52.3/ 2/ 52	60.8/ 3/ 182	33.2/ 2/ 33
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.2/ 2/ 0	.1/ 3/ 0	.4/ 2/ 0
DILUTION FACTOR	27.06	19.99	8.73	35.24
HC CONCENTRATION PPM	31	43	48	15
CO CONCENTRATION PPM	82	131	109	65
CO2 CONCENTRATION PCT	.44	.62	1.49	.35
NOX CONCENTRATION PPM	33.6	52.1	182.1	32.8
HC MASS GRAMS	4.71	6.73	7.67	2.34
CO MASS GRAMS	25.36	41.21	35.06	20.24
CO2 MASS GRAMS	2169.3	3075.1	7548.1	1728.3
NOX MASS GRAMS	21.00	33.11	117.76	20.64
FUEL KG (LB)	.701 (1.55)	.997 (2.20)	2.405 (5.30)	.557 (1.23)
KW HR (HP HR)	1.61 (2.16)	2.98 (4.00)	9.50 (12.74)	1.67 (2.23)
BSHC G/KW HR (G/HP HR)	2.92 (2.18)	2.26 (1.69)	.81 (.60)	1.40 (1.05)
BSCO G/KW HR (G/HP HR)	15.72 (11.73)	13.83 (10.31)	3.69 (2.75)	12.15 (9.06)
BSCO2 G/KW HR (G/HP HR)	1345.15 (1003.07)	1031.92 (769.50)	794.46 (592.43)	1037.86 (773.93)
BSNOX G/KW HR (G/HP HR)	13.02 (9.71)	11.11 (8.29)	12.39 (9.24)	12.39 (9.24)
BSFC KG/KW HR (LB/HP HR)	.435 (.715)	.334 (.550)	.253 (.416)	.335 (.550)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.76 (21.13)
BSHC G/KW HR (G/HP HR)	1.36 (1.01)
BSCO G/KW HR (G/HP HR)	7.73 (5.77)
BSCO2 G/KW HR (G/HP HR)	921 (687)
BSNOX G/KW HR (G/HP HR)	12.22 (9.11)
BSFC KG/KW HR (LB/HP HR)	.296 (.486)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.919 (32.48)
MULTIPLIER FOR	G/TEST	1.176
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0746 (.0557)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2524 (.1145)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-2C (CONT'D). TEST D2-15 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL -0 CUM 350
ENGINE 4.0 L(855 CID) V-8
CVS NO. 10

TEST NO.D2-15 RUN
DATE 4/19/79
TIME 10:15 — DIESEL EM-273-F
DYNO NO. 5 — BAG CART NO. 2

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 85 PCT
ABSOLUTE HUMIDITY 16.4 GM/KG(114.6 GRAINS/LB) — NOX HUMIDITY C.F. 1.2287

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6161	6267	6373	6204
TIME SECONDS	295.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	266.5 (9411)	271.0 (9573)	275.6 (9735)	268.3 (9477)
HC SAMPLE METER/RANGE/PPM	5.5/22/ 28	7.6/22/ 38	8.3/22/ 42	5.5/22/ 28
HC BCKGRD METER/RANGE/PPM	14.5/ 1/ 14	14.4/ 1/ 14	14.5/ 1/ 14	14.0/ 1/ 14
CO SAMPLE METER/RANGE/PPM	25.3/11/ 81	33.5/11/ 112	30.8/11/ 102	20.6/11/ 64
CO BCKGRD METER/RANGE/PPM	.4/11/ 1	.4/11/ 1	.4/11/ 1	.8/11/ 2
CO2 SAMPLE METER/RANGE/PCT	24.7/ 3/ .40	37.5/ 3/ .63	81.4/ 3/ 1.50	23.6/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.2/ 3/ .03	2.1/ 3/ .03	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	32.1/ 2/ 32	58.2/ 2/ 58	60.8/ 3/ 182	34.7/ 2/ 35
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	0.0/ 3/ 0	.6/ 2/ 1
DILUTION FACTOR	32.33	20.74	8.84	34.02
HC CONCENTRATION PPM	14	24	29	14
CO CONCENTRATION PPM	77	107	95	60
CO2 CONCENTRATION PCT	.37	.60	1.47	.35
NOX CONCENTRATION PPM	32.0	58.1	182.4	34.1
HC MASS GRAMS	2.08	3.82	4.56	2.18
CO MASS GRAMS	23.94	33.69	30.48	18.75
CO2 MASS GRAMS	1797.8	2976.4	7440.9	1731.1
NOX MASS GRAMS	20.04	37.02	118.17	21.52
FUEL KG (LB)	.581 (1.28)	.959 (2.11)	2.365 (5.21)	.557 (1.23)
KW HR (HP HR)	1.72 (2.30)	2.98 (4.00)	9.47 (12.69)	1.65 (2.21)
BSHC G/KW HR (G/HP HR)	1.21 (.90)	1.28 (.96)	.48 (.36)	1.32 (.98)
BSCO G/KW HR (G/HP HR)	13.93 (10.39)	11.31 (8.43)	3.22 (2.40)	11.38 (8.48)
BSCO2 G/KW HR (G/HP HR)	1046.52 (780.39)	998.79 (744.79)	786.08 (586.18)	1050.57 (783.41)
BSNOX G/KW HR (G/HP HR)	11.67 (8.70)	12.42 (9.26)	12.48 (9.31)	13.06 (9.74)
BSFC KG/KW HR (LB/HP HR)	.338 (.556)	.322 (.529)	.250 (.411)	.338 (.556)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.81 (21.20)
BSHC G/KW HR (G/HP HR)	.80 (.60)
BSCO G/KW HR (G/HP HR)	6.76 (5.04)
BSCO2 G/KW HR (G/HP HR)	882 (658)
BSNOX G/KW HR (G/HP HR)	12.44 (9.28)
BSFC KG/KW HR (LB/HP HR)	.282 (.464)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.891 (31.46)
MULTIPLIER FOR	G/TEST	1.214
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0768 (.0573)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2721 (.1234)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-2D. TEST D2-16 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL -8 CUM 350
ENGINE *.0 L(855 CID) V-8
CVS NO. 10

TEST NO.D2-16 RUN
DATE 4/20/79
TIME 09:11
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 70 PCT
ABSOLUTE HUMIDITY 13.3 GM/KG(93.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0949

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	632.5 (24.9)	632.5 (24.9)	632.5 (24.9)	632.5 (24.9)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6266	6374	6204
TIME SECONDS	295.9	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	266.7 (9420)	270.4 (9549)	275.0 (9714)	267.7 (9455)
HC SAMPLE METER/RANGE/PPM	8.4/22/ 42	10.7/22/ 53	12.1/22/ 61	4.9/22/ 24
HC BCKGRD METER/RANGE/PPM	8.5/ 1/ 9	8.5/ 1/ 9	8.4/ 1/ 8	7.8/ 1/ 8
CO SAMPLE METER/RANGE/PPM	25.9/11/ 83	38.4/11/ 132	33.1/11/ 111	20.6/11/ 64
CO BCKGRD METER/RANGE/PPM	.1/11/ 0	0.0/11/ 0	.3/11/ 1	.2/11/ 1
CO2 SAMPLE METER/RANGE/PCT	28.6/ 3/ .47	39.7/ 3/ .67	81.9/ 3/ 1.50	23.4/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.7/ 3/ .04	2.3/ 3/ .04	2.1/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	34.6/ 2/ 35	56.0/ 2/ 56	62.0/ 3/ 186	36.0/ 2/ 36
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	.1/ 3/ 0	.3/ 2/ 0
DILUTION FACTOR	27.66	19.43	8.82	34.35
HC CONCENTRATION PPM	34	45	53	17
CO CONCENTRATION PPM	80	128	104	62
CO2 CONCENTRATION PCT	.43	.63	1.47	.35
NOX CONCENTRATION PPM	34.4	55.7	185.7	35.7
HC MASS GRAMS	5.22	7.05	8.44	2.61
CO MASS GRAMS	24.96	40.15	33.39	19.30
CO2 MASS GRAMS	2119.4	3131.8	7911.0	1717.3
NOX MASS GRAMS	19.22	31.55	106.99	20.02
FUEL KG (LB)	.686 (1.51)	1.014 (2.24)	2.361 (5.21)	.554 (1.22)
KW HR (HP HR)	1.58 (2.12)	2.98 (4.00)	9.52 (12.76)	1.67 (2.23)
BSHC G/KW HR (G/HP HR)	3.31 (2.47)	2.37 (1.76)	.89 (.66)	1.57 (1.17)
BSCO G/KW HR (G/HP HR)	15.82 (11.80)	13.47 (10.05)	3.51 (2.62)	11.59 (8.64)
BSCO2 G/KW HR (G/HP HR)	1343.37 (1001.75)	1050.94 (783.69)	778.60 (580.60)	1031.25 (769.00)
BSNOX G/KW HR (G/HP HR)	12.18 (9.08)	10.59 (7.89)	11.24 (8.38)	12.02 (8.97)
BSFC KG/KW HR (LB/HP HR)	.435 (.715)	.340 (.560)	.298 (.408)	.332 (.546)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.24 (	21.11)
BSHC G/KW HR (G/HP HR)	1.48 (	1.10)
BSCO G/KW HR (G/HP HR)	7.48 (	5.58)
BSCO2 G/KW HR (G/HP HR)	913 (	681)
BSNOX G/KW HR (G/HP HR)	11.29 (	8.42)
BSFC KG/KW HR (LB/HP HR)	.293 (	.482)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	.907 (	32.03)
MULTIPLIER FOR G/TEST	1.191	
MULTIPLIER FOR G/KW HR (G/HP HR)	.0756 (	.0564)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	.2580 (	.1171)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00 (	0.0)

TABLE B-2D (CONT'D). TEST D2-16 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5099-001

ENGINE NO.C350
ENGINE MODEL -8 CUM 350
ENGINE 5.8 L(855 CID) V-8
CVS NO. 10

TEST NO.D2-16 RUN
DATE 9/20/79
TIME
DYNO NO. 5

DIESEL EM-273-F
BAG CART NO. 2

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 71 PCT
ABSOLUTE HUMIDITY 14.0 GM/KG(97.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.1201

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)
BLOWER INLET P MM. H2O(IN. H2O)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6185	6266	6378	6205
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	267.0 (9431)	270.5 (9554)	275.4 (9726)	267.9 (9461)
HC SAMPLE METER/RANGE/PPM	4.7/22/ 23	6.9/22/ 34	7.5/22/ 37	4.6/22/ 23
HC BCKGRD METER/RANGE/PPM	10.4/ 1/ 10	10.0/ 1/ 10	9.5/ 1/ 10	9.0/ 1/ 9
CO SAMPLE METER/RANGE/PPM	23.6/11/ 75	32.1/11/ 107	29.3/11/ 96	19.9/11/ 62
CO BCKGRD METER/RANGE/PPM	.4/11/ 1	.2/11/ 1	.4/11/ 1	.3/11/ 1
CO2 SAMPLE METER/RANGE/PCT	24.7/ 3/ .90	37.2/ 3/ .63	82.4/ 3/ 1.51	23.8/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.8/ 3/ .04	2.7/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	33.3/ 2/ 33	60.5/ 2/ 60	63.1/ 3/ 189	36.1/ 2/ 36
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	0.0/ 3/ 0	.3/ 2/ 0
DILUTION FACTOR	32.90	20.94	8.78	33.78
HC CONCENTRATION PPM	13	25	29	14
CO CONCENTRATION PPM	72	102	90	59
CO2 CONCENTRATION PCT	.36	.59	1.48	.35
NOX CONCENTRATION PPM	33.1	60.2	189.3	35.8
HC MASS GRAMS	2.04	3.87	9.59	2.21
CO MASS GRAMS	22.26	32.28	28.86	18.99
CO2 MASS GRAMS	1765.0	2899.7	7997.1	1708.5
NOX MASS GRAMS	18.94	39.90	111.68	20.55
FUEL KG (LB)	.569 (1.26)	.934 (2.06)	2.367 (5.22)	.550 (1.21)
KW HR (HP HR)	1.72 (2.30)	2.96 (3.97)	9.47 (12.69)	1.63 (2.19)
BSHC G/KW HR (G/HP HR)	1.19 (.89)	1.31 (.97)	.48 (.36)	1.35 (1.01)
BSCO G/KW HR (G/HP HR)	12.96 (9.66)	10.90 (8.13)	3.05 (2.27)	11.34 (8.46)
BSCO2 G/KW HR (G/HP HR)	1027.91 (766.19)	978.82 (729.91)	786.73 (586.66)	1048.02 (781.51)
BSNOX G/KW HR (G/HP HR)	11.03 (8.22)	11.78 (8.78)	11.80 (8.80)	12.61 (9.40)
BSFC KG/KW HR (LB/HP HR)	.331 (.545)	.315 (.518)	.250 (.411)	.337 (.555)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.78 (21.16)
BSHC G/KW HR (G/HP HR)	.81 (.60)
BSCO G/KW HR (G/HP HR)	6.46 (4.82)
BSCO2 G/KW HR (G/HP HR)	876 (653)
BSNOX G/KW HR (G/HP HR)	11.79 (8.80)
BSFC KG/KW HR (LB/HP HR)	.280 (.461)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.899 (31.76)
MULTIPLIER FOR	G/TEST	1.202
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0762 (.0568)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2720 (.1234)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-3A. TEST D3-4 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 7S DETROIT 6V92T
ENGINE 9.0 L(552 CID) V-6
CVS NO. 10

TEST NO.D3-4 RUN
DATE 5/ 8/79
TIME 1013?
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 2

BAROMETER 734.57 MM HG(28.92 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 59 PCT
ABSOLUTE HUMIDITY 12.6 GM/KG(87.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0695

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	617.2 (24.3)	617.2 (24.3)	617.2 (24.3)	617.2 (24.3)
BLOWER INLET P MM. H2O(IN. H2O)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6264	6375	6202
TIME SECONDS	295.9	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	265.3 (9371)	268.9 (9496)	273.6 (9665)	266.2 (9402)
HC SAMPLE METER/RANGE/PPM	4.7/22/ 23	6.2/22/ 31	9.6/22/ 48	4.9/22/ 25
HC BCKGRD METER/RANGE/PPM	10.8/ 1/ 11	10.2/ 1/ 10	10.2/ 1/ 10	9.7/ 1/ 10
CO SAMPLE METER/RANGE/PPM	32.8/13/ 31	37.0/13/ 35	55.0/13/ 52	59.3/13/ 57
CO BCKGRD METER/RANGE/PPM	1.9/13/ 1	1.9/13/ 1	1.0/13/ 1	.9/13/ 1
CO2 SAMPLE METER/RANGE/PCT	25.3/ 3/ .41	31.8/ 3/ .53	69.0/ 3/ 1.23	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	3.0/ 3/ .05	2.3/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	32.5/ 2/ 33	40.6/ 2/ 41	41.4/ 3/ 124	32.9/ 2/ 33
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	1.0/ 2/ 1	.3/ 3/ 1	.9/ 2/ 1
DILUTION FACTOR	31.93	25.02	10.78	37.21
HC CONCENTRATION PPM	13	21	39	15
CO CONCENTRATION PPM	29	33	49	55
CO2 CONCENTRATION PCT	.37	.48	1.20	.32
NOX CONCENTRATION PPM	31.7	39.6	123.4	32.0
HC MASS GRAMS	1.97	3.32	6.10	2.35
CO MASS GRAMS	8.89	10.22	15.74	16.90
CO2 MASS GRAMS	1811.8	2387.6	6019.2	1542.8
NOX MASS GRAMS	17.14	21.70	68.75	17.36
FUEL KG (LB)	.578 (1.27)	.761 (1.68)	1.911 (4.21)	.497 (1.10)
KW HR (HP HR)	1.63 (2.19)	2.38 (3.20)	7.87 (10.55)	1.63 (2.19)
BSHC G/KW HR (G/HP HR)	1.21 (.90)	1.39 (1.04)	.78 (.58)	1.44 (1.07)
BSCO G/KW HR (G/HP HR)	5.45 (4.07)	4.29 (3.20)	2.00 (1.49)	10.37 (7.73)
BSCO2 G/KW HR (G/HP HR)	1111.37 (828.75)	1001.50 (746.82)	769.76 (570.28)	946.37 (705.71)
BSNOX G/KW HR (G/HP HR)	10.51 (7.84)	9.10 (6.79)	8.73 (6.51)	10.65 (7.94)
BSFC KG/KW HR (LB/HP HR)	.354 (.582)	.319 (.525)	.243 (.399)	.305 (.501)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	13.52 (18.12)
BSHC G/KW HR (G/HP HR)	1.02 (.76)
BSCO G/KW HR (G/HP HR)	3.83 (2.86)
BSCO2 G/KW HR (G/HP HR)	870 (649)
BSNOX G/KW HR (G/HP HR)	9.25 (6.89)
BSFC KG/KW HR (LB/HP HR)	.277 (.456)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.945 (33.39)
MULTIPLIER FOR	G/TEST	1.136
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0891 (.0627)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3032 (.1375)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-3A (CONT'D). TEST D3-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 75 DETROIT 6V92T
ENGINE 9.0 L(552 CID) V-6
CVS NO. 10

TEST NO. D3-4 RUN
DATE 5/ 8/79
TIME 11:14
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 2

BAROMETER 734.57 MM HG(28.92 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 54 PCT
ABSOLUTE HUMIDITY 11.0 GM/KG(77.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0099

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)
BLOWER INLET P MM. H2O(IN. H2O)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6265	6374	6203
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	265.3 (9369)	268.8 (9495)	273.5 (9661)	266.2 (9401)
HC SAMPLE METER/RANGE/PPM	9.9/22/ 25	6.2/22/ 31	9.7/22/ 49	5.0/22/ 25
HC BCKGRD METER/RANGE/PPM	9.9/ 1/ 9	9.6/ 1/ 10	9.6/ 1/ 10	9.6/ 1/ 10
CO SAMPLE METER/RANGE/PPM	55.6/13/ 53	43.0/13/ 41	52.1/13/ 50	61.0/13/ 58
CO BCKGRD METER/RANGE/PPM	.3/13/ 0	.3/13/ 0	.7/13/ 1	.8/13/ 1
CO2 SAMPLE METER/RANGE/PCT	18.2/ 3/ .29	29.9/ 3/ .50	69.2/ 3/ 1.24	22.2/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.3/ 3/ .04	2.9/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	27.3/ 2/ 27	43.3/ 2/ 43	43.2/ 3/ 130	34.5/ 2/ 34
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.5/ 2/ 1	.1/ 3/ 0	.7/ 2/ 1
DILUTION FACTOR	44.64	26.68	10.75	36.32
HC CONCENTRATION PPM	15	22	40	16
CO CONCENTRATION PPM	52	39	47	56
CO2 CONCENTRATION PCT	.26	.46	1.20	.32
NOX CONCENTRATION PPM	26.7	42.8	129.3	33.8
HC MASS GRAMS	2.35	3.37	6.30	2.44
CO MASS GRAMS	15.93	12.31	19.96	17.48
CO2 MASS GRAMS	1247.0	2271.6	6029.8	1577.3
NOX MASS GRAMS	13.69	22.24	68.34	17.39
FUEL KG (LB)	.403 (.89)	.726 (1.60)	1.915 (4.22)	.508 (1.12)
KW HR (HP HR)	1.70 (2.28)	2.44 (3.27)	7.82 (10.48)	1.61 (2.16)
BSHC G/KW HR (G/HP HR)	1.38 (1.03)	1.38 (1.03)	.81 (.60)	1.51 (1.13)
BSCO G/KW HR (G/HP HR)	9.37 (6.99)	5.05 (3.77)	1.91 (1.43)	10.84 (8.08)
BSCO2 G/KW HR (G/HP HR)	733.36 (546.87)	932.31 (695.22)	771.26 (575.13)	978.04 (729.32)
BSNOX G/KW HR (G/HP HR)	8.05 (6.00)	9.13 (6.81)	8.74 (6.52)	10.78 (8.04)
BSFC KG/KW HR (LB/HP HR)	.237 (.390)	.298 (.490)	.245 (.403)	.315 (.518)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	13.57 (18.19)
BSHC G/KW HR (G/HP HR)	1.07 (.79)
BSCO G/KW HR (G/HP HR)	4.47 (3.33)
BSCO2 G/KW HR (G/HP HR)	820 (611)
BSNOX G/KW HR (G/HP HR)	8.97 (6.69)
BSFC KG/KW HR (LB/HP HR)	.262 (.430)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.899 (31.76)
MULTIPLIER FOR	G/TEST	1.194
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0880 (.0656)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3362 (.1525)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-3B. TEST D3-5 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 75 DETROIT 6V92T
ENGINE 9.0 L(552 CID) V-6
CVS NO. 10

TEST NO.D3-5 RUN
DATE 5/ 9/79
TIME 10:42
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 2

BAROMETER 733.55 MM HG(28.88 IN HG)
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)

RELATIVE HUMIDITY 58 PCT
ABSOLUTE HUMIDITY 12.8 GM/KG(89.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0745

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LANF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)
BLOWER INLET P MM. H2O(IN. H2O)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6265	6374	6203
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	269.9 (9357)	268.5 (9485)	273.2 (9650)	265.9 (9391)
HC SAMPLE METER/RANGE/PPM	4.6/22/ 23	6.5/22/ 33	10.0/22/ 50	5.2/22/ 26
HC BCKGRD METER/RANGE/PPM	10.0/ 1/ 10	10.0/ 1/ 10	10.4/ 1/ 10	9.8/ 1/ 10
CO SAMPLE METER/RANGE/PPM	31.8/13/ 30	36.4/13/ 34	53.1/13/ 51	58.1/13/ 56
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1	.6/13/ 1	1.0/13/ 1	.5/13/ 0
CO2 SAMPLE METER/RANGE/PCT	27.4/ 3/ .46	33.2/ 3/ .55	72.0/ 3/ 1.29	23.5/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.7/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	32.0/ 2/ 32	36.7/ 2/ 37	40.8/ 3/ 122	11.2/ 3/ 34
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.2/ 2/ 0	.2/ 3/ 1
DILUTION FACTOR	28.81	23.90	10.28	34.26
HC CONCENTRATION PPM	13	23	91	16
CO CONCENTRATION PPM	28	33	48	54
CO2 CONCENTRATION PCT	.42	.51	1.26	.34
NOX CONCENTRATION PPM	31.9	36.6	122.2	33.0
HC MASS GRAMS	2.06	3.57	6.41	2.52
CO MASS GRAMS	8.69	10.24	15.13	14.62
CO2 MASS GRAMS	2016.2	2529.9	6281.1	1663.1
NOX MASS GRAMS	17.37	20.20	68.64	18.04
FUEL KG (LB)	.642 (1.42)	.806 (1.78)	1.994 (4.40)	.535 (1.18)
KW HR (HP HR)	1.60 (2.14)	2.40 (3.22)	7.82 (10.48)	1.63 (2.19)
BSHC G/KW HR (G/HP HR)	1.29 (.96)	1.49 (1.11)	.82 (.61)	1.55 (1.15)
BSCO G/KW HR (G/HP HR)	5.45 (4.06)	9.26 (3.18)	1.94 (1.44)	10.14 (7.60)
BSCO2 G/KW HR (G/HP HR)	1263.96 (942.53)	1053.47 (785.57)	803.40 (599.09)	1020.16 (760.73)
BSNOX G/KW HR (G/HP HR)	10.89 (8.12)	8.41 (6.27)	8.78 (6.55)	11.07 (8.25)
BSFC KG/KW HR (LB/HP HR)	.402 (.662)	.336 (.552)	.255 (.419)	.328 (.540)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	13.45 (18.03)
BSHC G/KW HR (G/HP HR)	1.08 (.81)
BSCO G/KW HR (G/HP HR)	3.77 (2.81)
BSCO2 G/KW HR (G/HP HR)	929 (693)
BSNOX G/KW HR (G/HP HR)	9.24 (6.89)
BSFC KG/KW HR (LB/HP HR)	.396 (.486)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.001 (35.35)
MULTIPLIER FOR	G/TEST	1.072
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0797 (.0594)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2695 (.1222)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-3B (CONT'D). TEST D3-5 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 75 DETROIT 6V92T
ENGINE 9.0 L(552 CID) V-6
CVS NO. 10

TEST NO.D3-5 RUN
DATE 5/ 9/79
TIME 11:22
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 2

BAROMETER 733.30 MM HG(28.87 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 57 PCT
ABSOLUTE HUMIDITY 11.2 GM/KG(78.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0173

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)
BLOWER INLET P MM. H2O(IN. H2O)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6265	6376	6203
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	264.9 (9356)	268.4 (9480)	273.2 (9648)	265.7 (9386)
HC SAMPLE METER/RANGE/PPM	5.0/22/ 25	6.2/22/ 31	9.5/22/ 48	5.1/22/ 25
HC BCKGRD METER/RANGE/PPM	11.0/ 1/ 11	11.0/ 1/ 11	11.5/ 1/ 11	10.8/ 1/ 11
CO SAMPLE METER/RANGE/PPM	50.9/13/ 98	37.0/13/ 35	50.1/13/ 98	56.1/13/ 54
CO BCKGRD METER/RANGE/PPM	.3/13/ 0	.6/13/ 1	.7/13/ 1	.3/13/ 0
CO2 SAMPLE METER/RANGE/PCT	21.0/ 3/ .34	27.1/ 3/ .45	68.0/ 3/ 1.21	21.1/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	1.6/ 3/ .02	1.2/ 3/ .02	1.5/ 3/ .02	1.2/ 3/ .02
NOX SAMPLE METER/RANGE/PPM	30.6/ 2/ 31	38.0/ 2/ 38	42.2/ 3/ 127	32.6/ 2/ 33
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.5/ 2/ 1	.6/ 2/ 1	.3/ 2/ 0
DILUTION FACTOR	38.58	29.62	10.96	38.33
HC CONCENTRATION PPM	14	20	37	15
CO CONCENTRATION PPM	96	33	95	52
CO2 CONCENTRATION PCT	.32	.43	1.19	.32
NOX CONCENTRATION PPM	30.2	37.5	126.1	32.3
HC MASS GRAMS	2.15	3.15	5.87	2.29
CO MASS GRAMS	14.33	10.44	14.33	16.08
CO2 MASS GRAMS	1534.9	2104.9	5963.6	1577.2
NOX MASS GRAMS	15.57	19.60	67.01	16.71
FUEL KG (LB)	.493 (1.09)	.672 (1.48)	1.893 (4.17)	.507 (1.12)
KW HR (HP HR)	1.61 (2.16)	2.37 (3.17)	7.80 (10.46)	1.63 (2.19)
BSHC G/KW HR (G/HP HR)	1.34 (1.00)	1.33 (.99)	.75 (.56)	1.40 (1.05)
BSCO G/KW HR (G/HP HR)	8.88 (6.62)	4.41 (3.29)	1.84 (1.37)	9.86 (7.36)
BSCO2 G/KW HR (G/HP HR)	951.74 (709.72)	884.45 (663.27)	764.50 (570.09)	967.96 (721.93)
BSNOX G/KW HR (G/HP HR)	9.66 (7.20)	8.28 (6.17)	8.59 (6.41)	10.25 (7.64)
BSFC KG/KW HR (LB/HP HR)	.306 (.503)	.284 (.467)	.243 (.399)	.311 (.512)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	13.41 (17.98)
BSHC G/KW HR (G/HP HR)	1.00 (.75)
BSCO G/KW HR (G/HP HR)	4.11 (3.07)
BSCO2 G/KW HR (G/HP HR)	834 (622)
BSNOX G/KW HR (G/HP HR)	8.87 (6.61)
BSFC KG/KW HR (LB/HP HR)	.266 (.437)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.894 (31.57)
MULTIPLIER FOR	G/TEST	1.200
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0895 (.0667)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3365 (.1526)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-4A. TEST D4-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL 78 CUM 350 NTCC
ENGINE 5.7 L(350 CID) I-6
CVS NO. 10

TEST NO.D4-4 RUN
DATE 6/22/79
TIME 12:13
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 743.71 MM HG(29.28 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 67 PCT
ABSOLUTE HUMIDITY 13.1 GM/KG(92.0 GRAINS/LB)

NOX HUMIDITY C.F. 1.0870

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	609.6 (24.0)	609.6 (24.0)	609.6 (24.0)	609.6 (24.0)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6184	6267	6376	6203
TIME SECONDS	299.9	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	268.6 (9487)	272.4 (9622)	277.2 (9790)	269.6 (9523)
HC SAMPLE METER/RANGE/PPM	6.2/22/ 31	7.9/22/ 39	6.8/22/ 34	6.4/22/ 32
HC BCKGRD METER/RANGE/PPM	9.8/ 1/ 10	9.8/ 1/ 10	10.4/ 1/ 10	9.6/ 1/ 10
CO SAMPLE METER/RANGE/PPM	50.5/13/ 98	45.1/13/ 92	56.3/13/ 59	42.4/13/ 39
CO BCKGRD METER/RANGE/PPM	5.3/13/ 5	1.6/13/ 1	1.6/13/ 1	1.4/13/ 1
CO2 SAMPLE METER/RANGE/PCT	28.4/ 3/ .47	35.1/ 3/ .59	77.9/ 3/ 1.43	24.0/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.2/ 3/ .05	3.4/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	23.2/ 2/ 23	33.6/ 2/ 34	37.0/ 3/ 111	24.2/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1	.8/ 2/ 1	.2/ 3/ 1	.8/ 2/ 1
DILUTION FACTOR	28.21	22.50	9.34	33.73
HC CONCENTRATION PPM	22	30	25	23
CO CONCENTRATION PPM	42	39	50	37
CO2 CONCENTRATION PCT	.42	.54	1.38	.34
NOX CONCENTRATION PPM	22.2	32.8	110.5	23.4
HC MASS GRAMS	3.37	4.71	3.99	3.53
CO MASS GRAMS	13.09	12.49	16.11	11.63
CO2 MASS GRAMS	2058.7	2697.7	7003.4	1684.8
NOX MASS GRAMS	12.42	18.60	63.67	13.13
FUEL KG (LB)	.659 (1.45)	.861 (1.90)	2.220 (4.89)	.540 (1.19)
KW HR (HP HR)	1.82 (2.44)	2.80 (3.76)	9.31 (12.48)	1.82 (2.44)
BSHC G/KW HR (G/HP HR)	1.85 (1.38)	1.68 (1.25)	.43 (.32)	1.94 (1.44)
BSCO G/KW HR (G/HP HR)	7.18 (5.35)	4.45 (3.32)	1.73 (1.29)	6.38 (4.76)
BSCO2 G/KW HR (G/HP HR)	1129.24 (842.07)	961.84 (717.24)	752.40 (561.06)	924.14 (689.13)
BSNOX G/KW HR (G/HP HR)	6.81 (5.08)	6.63 (4.95)	6.84 (5.10)	7.20 (5.37)
BSFC KG/KW HR (LB/HP HR)	.361 (.594)	.307 (.505)	.238 (.392)	.296 (.487)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.76 (	21.13)
BSHC G/KW HR (G/HP HR)	.99 (	.74)
BSCO G/KW HR (G/HP HR)	3.38 (	2.52)
BSCO2 G/KW HR (G/HP HR)	853 (	636)
BSNOX G/KW HR (G/HP HR)	6.84 (	5.10)
BSFC KG/KW HR (LB/HP HR)	.272 (	.447)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.920 (32.51)
MULTIPLIER FOR	G/TEST	1.182
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0750 (.0559)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2762 (.1253)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-4A (CONT'D). TEST D4-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL 78 CUM 350 NTCC
ENGINE 5.7 L(350 CID) I-6
CVS NO. 10

TEST NO.D4-4 RUN
DATE 6/22/79
TIME 12:33
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 743.71 MM HG(29.28 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 65 PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0530

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)
BLOWER INLET P MM. H20(IN. H20)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6184	6269	6379	6202
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	268.5 (9484)	272.0 (9607)	277.0 (9784)	269.3 (9512)
HC SAMPLE METER/RANGE/PPM	5.6/22/ 28	8.4/22/ 42	7.1/22/ 36	6.8/22/ 34
HC BCKGRD METER/RANGE/PPM	7.5/ 1/ 8	10.5/ 1/ 10	8.4/ 1/ 8	8.4/ 1/ 8
CO SAMPLE METER/RANGE/PPM	54.5/13/ 52	45.4/13/ 42	52.4/13/ 50	41.2/13/ 38
CO BCKGRD METER/RANGE/PPM	.9/13/ 1	.9/13/ 1	.9/13/ 1	.7/13/ 1
CO2 SAMPLE METER/RANGE/PCT	23.9/ 3/ .39	32.9/ 3/ .55	74.8/ 3/ 1.36	23.5/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	2.8/ 3/ .04	3.3/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	22.1/ 2/ 22	35.7/ 2/ 36	36.0/ 3/ 108	23.5/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.4/ 2/ 0	.2/ 3/ 1	.7/ 2/ 1
DILUTION FACTOR	33.81	24.10	9.78	34.47
HC CONCENTRATION PPM	21	32	28	26
CO CONCENTRATION PPM	50	40	47	36
CO2 CONCENTRATION PCT	.34	.51	1.32	.34
NOX CONCENTRATION PPM	21.5	35.3	107.5	22.8
HC MASS GRAMS	3.21	5.01	4.49	4.04
CO MASS GRAMS	15.53	12.77	15.04	11.44
CO2 MASS GRAMS	1684.1	2523.6	6681.2	1654.7
NOX MASS GRAMS	11.64	19.35	59.96	12.38
FUEL KG (LB)	.542 (1.19)	.807 (1.78)	2.118 (4.67)	.531 (1.17)
KW HR (HP HR)	1.84 (2.47)	2.91 (3.90)	9.26 (12.41)	1.82 (2.44)
BSHC G/KW HR (G/HP HR)	1.74 (1.30)	1.72 (1.28)	.49 (.36)	2.22 (1.65)
BSCO G/KW HR (G/HP HR)	8.44 (6.29)	4.39 (3.27)	1.62 (1.21)	6.27 (4.68)
BSCO2 G/KW HR (G/HP HR)	914.97 (682.29)	867.29 (646.70)	721.86 (538.29)	907.66 (676.84)
BSNOX G/KW HR (G/HP HR)	6.32 (4.72)	6.65 (4.96)	6.48 (4.83)	6.79 (5.06)
BSFC KG/KW HR (LB/HP HR)	.294 (.484)	.277 (.456)	.229 (.376)	.291 (.479)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.83 (21.23)
BSHC G/KW HR (G/HP HR)	1.06 (.79)
BSCO G/KW HR (G/HP HR)	3.46 (2.58)
BSCO2 G/KW HR (G/HP HR)	792 (591)
BSNOX G/KW HR (G/HP HR)	6.53 (4.87)
BSFC KG/KW HR (LB/HP HR)	.253 (.415)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.077 (38.03)
MULTIPLIER FOR	G/TEST	1.010
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0638 (.0476)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2525 (.1145)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-4B. TEST D4-7 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C350
ENGINE MODEL 78 CUM 350 NTCC
ENGINE 5.7 L(350 CID) I-6
CVS NO. 10

TEST NO. D4-7 RUN
DATE 6/27/79
TIME 12:54
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 745.74 MM HG(29.36 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 10.4 GM/KG(73.0 GRAINS/LB)

NOX HUMIDITY C.F. .9905

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)
BLOWER INLET P MM. H2O(IN. H2O)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6268	6373	6201
TIME SECONDS	297.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	269.6 (9522)	273.4 (9657)	278.0 (9819)	270.5 (9553)
HC SAMPLE METER/RANGE/PPM	6.6/22/ 33	8.6/22/ 43	7.9/22/ 40	7.4/22/ 37
HC BCKGRD METER/RANGE/PPM	9.0/ 1/ 9	8.8/ 1/ 9	9.2/ 1/ 9	9.5/ 1/ 10
CO SAMPLE METER/RANGE/PPM	46.0/13/ 43	42.0/13/ 39	51.8/13/ 49	40.3/13/ 37
CO BCKGRD METER/RANGE/PPM	.3/13/ 0	1.1/13/ 1	1.7/13/ 1	1.5/13/ 1
CO2 SAMPLE METER/RANGE/PCT	26.6/ 3/ .44	33.0/ 3/ .55	74.8/ 3/ 1.36	22.8/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.4/ 3/ .04	2.8/ 3/ .04	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	24.1/ 2/ 24	35.1/ 2/ 35	38.5/ 3/ 115	24.0/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	2.2/ 2/ 2	1.5/ 2/ 2	.3/ 3/ 1	.7/ 2/ 1
DILUTION FACTOR	30.24	24.03	9.77	35.56
HC CONCENTRATION PPM	25	35	31	28
CO CONCENTRATION PPM	42	37	46	35
CO2 CONCENTRATION PCT	.40	.51	1.32	.32
NOX CONCENTRATION PPM	22.0	33.7	114.7	23.3
HC MASS GRAMS	3.81	5.44	5.03	4.35
CO MASS GRAMS	13.07	11.75	14.75	11.04
CO2 MASS GRAMS	1953.4	2575.3	6740.2	1594.5
FUEL KG (LB)	11.22	17.44	60.41	11.95
KW HR (HP HR)	.626 (1.38)	.823 (1.81)	2.137 (4.71)	.512 (1.13)
	1.70 (2.28)	2.70 (3.62)	8.87 (11.89)	1.68 (2.26)
BSHC G/KW HR (G/HP HR)	2.24 (1.67)	2.02 (1.50)	.57 (.42)	2.58 (1.93)
BSCO G/KW HR (G/HP HR)	7.68 (5.73)	4.35 (3.25)	1.66 (1.24)	6.56 (4.89)
BSCO2 G/KW HR (G/HP HR)	1148.82 (856.67)	953.99 (711.39)	759.90 (566.65)	947.49 (706.54)
BSNOX G/KW HR (G/HP HR)	6.60 (4.92)	6.46 (4.82)	6.81 (5.08)	7.10 (5.30)
BSFC KG/KW HR (LB/HP HR)	.368 (.605)	.305 (.501)	.241 (.396)	.305 (.501)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.95 (	20.05)
BSHC G/KW HR (G/HP HR)	1.25 (	.93)
BSCO G/KW HR (G/HP HR)	3.38 (	2.52)
BSCO2 G/KW HR (G/HP HR)	860 (	642)
BSNOX G/KW HR (G/HP HR)	6.76 (	5.04)
BSFC KG/KW HR (LB/HP HR)	.274 (	.451)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW SCM(SCF)	.956 (	33.77)
MULTIPLIER FOR G/TEST	1.142	
MULTIPLIER FOR G/KW HR (G/HP HR)	.0764 (	.0569)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	.2786 (	.1264)
20 X 20 FILTERS		
SAMPLE FLOW SCM(SCF)	0.00 (	0.0)

TABLE B-4B (CONT'D). TEST D4-7 EMISSIONS RESULTS

ENGINE NO.C350
ENGINE MODEL 78 CUM 350 NTCC
ENGINE 5.7 L(350 CID) I-6
CVS NO. 10

BAROMETER 745.74 MM HG(29.36 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D4-7 RUN
DATE 6/27/79
TIME 01:34
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

RELATIVE HUMIDITY 57 PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0030

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)	622.3 (24.5)
BLOWER INLET P MM. H2O(IN. H2O)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6266	6377	6204
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	269.7 (9525)	273.3 (9654)	278.2 (9826)	270.6 (9559)
HC SAMPLE METER/RANGE/PPM	6.6/22/ 33	8.6/22/ 43	7.8/22/ 39	8.3/22/ 41
HC BCKGRD METER/RANGE/PPM	9.0/ 1/ 9	9.5/ 1/ 10	9.4/ 1/ 9	9.5/ 1/ 10
CO SAMPLE METER/RANGE/PPM	52.6/13/ 50	44.9/13/ 42	49.5/13/ 47	41.7/13/ 39
CO BCKGRD METER/RANGE/PPM	1.6/13/ 1	1.6/13/ 1	1.6/13/ 1	1.3/13/ 1
CO2 SAMPLE METER/RANGE/PCT	23.0/ 3/ .37	32.1/ 3/ .53	73.2/ 3/ 1.33	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	2.9/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	22.0/ 2/ 22	35.4/ 2/ 35	36.6/ 3/ 110	22.0/ 2/ 22
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.4/ 2/ 0	.1/ 3/ 0	.6/ 2/ 1
DILUTION FACTOR	35.16	24.74	10.02	37.37
HC CONCENTRATION PPM	24	34	30	32
CO CONCENTRATION PPM	47	39	43	37
CO2 CONCENTRATION PCT	.33	.49	1.29	.30
NOX CONCENTRATION PPM	21.4	35.0	109.5	21.4
HC MASS GRAMS	3.75	5.34	4.89	5.03
CO MASS GRAMS	14.89	12.53	14.04	11.52
CO2 MASS GRAMS	1621.6	2456.2	6570.1	1508.9
NOX MASS GRAMS	11.08	18.36	58.46	11.12
FUEL KG (LB)	.522 (1.15)	.786 (1.73)	2.083 (4.59)	.486 (1.07)
KW HR (HP HR)	1.74 (2.33)	2.79 (3.74)	8.87 (11.89)	1.70 (2.28)
BSHC G/KW HR (G/HP HR)	2.16 (1.61)	1.92 (1.43)	.55 (.41)	2.96 (2.20)
BSCO G/KW HR (G/HP HR)	8.55 (6.38)	4.49 (3.35)	1.58 (1.18)	6.78 (5.05)
BSCO2 G/KW HR (G/HP HR)	934.41 (696.79)	881.25 (657.15)	740.72 (552.35)	887.38 (661.72)
BSNOX G/KW HR (G/HP HR)	6.39 (4.76)	6.59 (4.91)	6.59 (4.92)	6.54 (4.88)
BSFC KG/KW HR (LB/HP HR)	.301 (.495)	.282 (.464)	.235 (.386)	.286 (.470)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.09 (20.24)
BSHC G/KW HR (G/HP HR)	1.26 (.94)
BSCO G/KW HR (G/HP HR)	3.51 (2.61)
BSCO2 G/KW HR (G/HP HR)	805 (601)
BSNOX G/KW HR (G/HP HR)	6.56 (4.89)
BSFC KG/KW HR (LB/HP HR)	.257 (.422)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.003 (35.42)
MULTIPLIER FOR	G/TEST	1.089
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0721 (.0538)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2808 (.1274)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-5A. TEST D5-11 EMISSIONS RESULTS

NO. 1 FUEL
COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-11 RUN 1
DATE 8/23/79
TIME 0911O
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 738.38 MM HG(29.07 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0015

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)
BLOWER INLET P MM. H2O(IN. H2O)	515.6 (20.3)	515.6 (20.3)	515.6 (20.3)	515.6 (20.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6263	6372	6201
TIME SECONDS	295.9	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	295.5 (10438)	299.5 (10577)	304.7 (10761)	296.5 (10472)
HC SAMPLE METER/RANGE/PPM	19.3/11/ 19	31.5/11/ 31	52.9/11/ 53	22.8/11/ 23
HC BCKGRD METER/RANGE/PPM	6.0/ 1/ 6	5.7/ 1/ 6	4.6/ 1/ 5	4.4/ 1/ 4
CO SAMPLE METER/RANGE/PPM	29.4/13/ 27	36.4/13/ 33	51.4/12/ 109	20.1/13/ 18
CO BCKGRD METER/RANGE/PCT	.9/13/ 1	.8/13/ 1	.3/12/ 1	.7/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.4/ 3/ .35	27.4/ 3/ .45	62.9/ 3/ 1.12	17.4/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.0/ 3/ .05	2.6/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	26.1/ 2/ 26	29.9/ 2/ 30	79.2/ 2/ 79	22.6/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.6/ 2/ 1	.6/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	38.29	29.39	11.79	47.55
HC CONCENTRATION PPM	13	26	49	18
CO CONCENTRATION PPM	25	32	105	17
CO2 CONCENTRATION PCT	.30	.41	1.08	.23
NOX CONCENTRATION PPM	25.4	29.3	78.7	21.8
HC MASS GRAMS	2.29	4.48	8.56	3.16
CO MASS GRAMS	8.66	11.09	37.09	5.82
CO2 MASS GRAMS	1636.1	2222.5	6050.7	1272.5
NOX MASS GRAMS	14.39	16.82	45.91	12.39
FUEL KG (LB)	.522 (1.15)	.711 (1.57)	1.934 (4.26)	.407 (.90)
KW HR (HP HR)	1.47 (1.97)	2.09 (2.80)	7.08 (9.50)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	1.55 (1.16)	2.15 (1.60)	1.21 (.90)	2.31 (1.72)
BSCO G/KW HR (G/HP HR)	5.88 (4.39)	5.31 (3.96)	5.24 (3.90)	4.26 (3.18)
BSCO2 G/KW HR (G/HP HR)	1111.10 (828.55)	1065.45 (794.50)	854.39 (637.12)	930.69 (694.01)
BSNOX G/KW HR (G/HP HR)	9.77 (7.29)	8.06 (6.01)	6.48 (4.83)	9.06 (6.76)
BSFC KG/KW HR (LB/HP HR)	.355 (.583)	.341 (.560)	.273 (.449)	.298 (.490)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.01 (16.10)
BSHC G/KW HR (G/HP HR)	1.54 (1.15)
BSCO G/KW HR (G/HP HR)	5.22 (3.89)
BSCO2 G/KW HR (G/HP HR)	931 (694)
BSNOX G/KW HR (G/HP HR)	7.45 (5.56)
BSFC KG/KW HR (LB/HP HR)	.298 (.489)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.072 (37.86)
MULTIPLIER FOR	G/TEST	1.116
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0929 (.0693)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3122 (.1416)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.92 (2858.2)

TABLE B-5A (CONT'D). TEST D5-11 EMISSIONS RESULTS
NO. 1 FUEL

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-11 RUN 1
DATE 8/23/79
TIME 0933
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 738.38 MM HG(29.07 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 57 PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0028

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)
BLOWER INLET P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6263	6372	6200
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	295.8 (10447)	299.7 (10585)	309.9 (10770)	296.7 (10479)
HC SAMPLE METER/RANGE/PPM	37.3/11/ 37	41.3/11/ 41	63.6/11/ 64	27.7/11/ 28
HC BCKGRD METER/RANGE/PPM	7.0/ 1/ 7	7.0/ 1/ 7	6.9/ 1/ 7	6.8/ 1/ 7
CO SAMPLE METER/RANGE/PPM	28.3/13/ 26	41.7/13/ 39	95.7/12/ 95	19.1/13/ 17
CO BCKGRD METER/RANGE/PPM	.5/13/ 0	.5/13/ 0	.4/12/ 1	.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	18.0/ 3/ .29	26.0/ 3/ .43	61.3/ 3/ 1.09	17.2/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.0/ 3/ .05	3.2/ 3/ .05	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	22.7/ 2/ 23	30.3/ 2/ 30	78.9/ 2/ 79	23.8/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	1.1/ 2/ 1	1.2/ 2/ 1	1.5/ 2/ 2
DILUTION FACTOR	45.57	30.95	12.13	48.05
HC CONCENTRATION PPM	30	35	57	21
CO CONCENTRATION PPM	24	37	91	16
CO2 CONCENTRATION PCT	.24	.38	1.04	.24
NOX CONCENTRATION PPM	21.8	29.2	77.8	22.3
HC MASS GRAMS	5.20	5.97	10.08	3.61
CO MASS GRAMS	8.44	12.98	32.32	5.55
CO2 MASS GRAMS	1291.4	2089.1	5829.0	1279.7
NOX MASS GRAMS	12.38	16.81	45.51	12.71
FUEL KG (LB)	.416 (.92)	.671 (1.48)	1.864 (4.11)	.410 (.90)
KW HR (HP HR)	1.40 (1.88)	2.16 (2.89)	7.10 (9.52)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	3.71 (2.76)	2.77 (2.06)	1.42 (1.06)	2.64 (1.97)
BSCO G/KW HR (G/HP HR)	6.02 (4.49)	6.02 (4.49)	4.55 (3.39)	4.06 (3.02)
BSCO2 G/KW HR (G/HP HR)	920.92 (686.73)	968.90 (722.51)	821.06 (612.27)	935.94 (697.93)
BSNOX G/KW HR (G/HP HR)	8.83 (6.58)	7.80 (5.81)	6.41 (4.78)	9.30 (6.93)
BSFC KG/KW HR (LB/HP HR)	.297 (.488)	.311 (.512)	.263 (.432)	.300 (.493)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.03 (16.13)
BSHC G/KW HR (G/HP HR)	2.07 (1.54)
BSCO G/KW HR (G/HP HR)	4.93 (3.68)
BSCO2 G/KW HR (G/HP HR)	872 (650)
BSNOX G/KW HR (G/HP HR)	7.27 (5.42)
BSFC KG/KW HR (LB/HP HR)	.279 (.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.117 (39.45)
MULTIPLIER FOR	G/TEST	1.072
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0891 (.0665)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3189 (.1446)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.12 (2865.2)

TABLE B-5B. TEST D5-12 EMISSIONS RESULTS
NO. 1 FUEL

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-12 RUN
DATE 8/24/79
TIME 10:30
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 739.65 MM HG(29.12 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.5 GRAINS/LB)

NOX HUMIDITY C.F. .9791

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	515.6 (20.3)	515.6 (20.3)	515.6 (20.3)	515.6 (20.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6263	6371	6202
TIME SECONDS	296.0	299.8	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	296.0 (10454)	299.9 (10593)	305.1 (10776)	297.0 (10490)
HC SAMPLE METER/RANGE/PPM	26.4/11/ 26	41.0/11/ 41	65.5/11/ 65	29.4/11/ 29
HC BCKGRD METER/RANGE/PPM	9.6/ 1/ 10	10.8/ 1/ 11	9.9/ 1/ 10	9.5/ 1/ 10
CO SAMPLE METER/RANGE/PPM	32.6/13/ 30	41.2/13/ 38	54.6/12/ 117	23.4/13/ 21
CO BCKGRD METER/RANGE/PPM	3.3/13/ 3	4.8/13/ 4	2.2/12/ 4	4.2/13/ 4
CO2 SAMPLE METER/RANGE/PCT	21.3/ 3/ .34	27.6/ 3/ .45	62.8/ 3/ 1.12	17.7/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.3/ 3/ .05	3.0/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	27.0/ 2/ 27	30.3/ 2/ 30	79.5/ 2/ 79	22.5/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	1.6/ 2/ 2	1.5/ 2/ 2	1.5/ 2/ 2	1.5/ 2/ 2
DILUTION FACTOR	38.36	29.07	11.79	46.56
HC CONCENTRATION PPM	17	31	56	20
CO CONCENTRATION PPM	26	33	109	17
CO2 CONCENTRATION PCT	.29	.40	1.08	.23
NOX CONCENTRATION PPM	25.4	28.9	78.1	21.0
HC MASS GRAMS	2.91	5.29	9.93	3.44
CO MASS GRAMS	9.03	11.58	38.81	5.86
CO2 MASS GRAMS	1588.5	2220.8	6016.3	1269.2
NOX MASS GRAMS	14.10	16.21	44.64	11.70
FUEL KG (LB)	.508 (1.12)	.711 (1.57)	1.926 (4.25)	.406 (.90)
KW HR (HP HR)	1.31 (1.76)	2.07 (2.77)	7.13 (9.57)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	2.22 (1.65)	2.56 (1.91)	1.39 (1.04)	2.52 (1.88)
BSCO G/KW HR (G/HP HR)	6.87 (5.12)	5.60 (4.18)	5.44 (4.06)	4.28 (3.19)
BSCO2 G/KW HR (G/HP HR)	1208.25 (900.99)	1073.62 (800.60)	843.27 (628.82)	928.29 (692.23)
BSNOX G/KW HR (G/HP HR)	10.73 (8.00)	7.84 (5.84)	6.26 (4.67)	8.56 (6.38)
BSFC KG/KW HR (LB/HP HR)	.387 (.635)	.344 (.565)	.270 (.444)	.297 (.489)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.88 (15.94)
BSHC G/KW HR (G/HP HR)	1.82 (1.35)
BSCO G/KW HR (G/HP HR)	5.49 (4.10)
BSCO2 G/KW HR (G/HP HR)	934 (696)
BSNOX G/KW HR (G/HP HR)	7.29 (5.44)
BSFC KG/KW HR (LB/HP HR)	.299 (.491)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.072 (37.87)
MULTIPLIER FOR	G/TEST	1.117
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0940 (.0701)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3146 (.1427)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.44 (2841.3)

TABLE B-5B (CONT'D). TEST D5-12 EMISSIONS RESULTS
NO. 1 FUEL

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-12 RUN
DATE 8/24/79
TIME
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 739.65 MM HG(29.12 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 9.5 GM/KG(66.8 GRAINS/LB)

NOX HUMIDITY C.F. .9629

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6261	6371	6201
TIME SECONDS	296.0	299.8	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	295.9 (10452)	299.7 (10587)	305.0 (10773)	296.9 (10486)
HC SAMPLE METER/RANGE/PPM	34.0/11/ 34	42.2/11/ 42	65.4/11/ 65	27.9/11/ 28
HC BCKGRD METER/RANGE/PPM	7.1/ 1/ 7	7.4/ 1/ 7	7.1/ 1/ 7	6.8/ 1/ 7
CO SAMPLE METER/RANGE/PPM	29.2/13/ 26	46.3/13/ 43	95.5/13/ 97	22.3/13/ 20
CO BCKGRD METER/RANGE/PPM	3.0/13/ 3	3.0/13/ 3	2.9/13/ 3	2.8/13/ 2
CO2 SAMPLE METER/RANGE/PCT	18.0/ 3/ .29	26.2/ 3/ .43	62.1/ 3/ 1.10	17.5/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.4/ 3/ .04	2.5/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	23.2/ 2/ 23	30.9/ 2/ 31	79.9/ 2/ 80	22.8/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.5/ 2/ 1	.5/ 2/ 1	.5/ 2/ 1
DILUTION FACTOR	45.60	30.67	11.96	47.15
HC CONCENTRATION PPM	27	35	59	21
CO CONCENTRATION PPM	23	40	91	17
CO2 CONCENTRATION PCT	.25	.39	1.07	.24
NOX CONCENTRATION PPM	22.9	30.4	79.4	22.3
HC MASS GRAMS	4.62	6.05	10.37	3.64
CO MASS GRAMS	8.02	13.87	32.31	5.92
CO2 MASS GRAMS	1349.3	2157.8	5975.7	1299.7
NOX MASS GRAMS	12.49	16.79	44.63	12.20
FUEL KG (LB)	.434 (.96)	.693 (1.53)	1.910 (4.21)	.416 (.92)
KW HR (HP HR)	1.37 (1.83)	2.19 (2.94)	7.10 (9.52)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	3.38 (2.52)	2.76 (2.06)	1.46 (1.09)	2.66 (1.99)
BSCO G/KW HR (G/HP HR)	5.87 (4.38)	6.33 (4.72)	4.55 (3.39)	4.33 (3.23)
BSCO2 G/KW HR (G/HP HR)	986.86 (735.90)	984.75 (734.33)	841.72 (627.67)	950.58 (708.85)
BSNOX G/KW HR (G/HP HR)	9.13 (6.81)	7.66 (5.72)	6.29 (4.69)	8.92 (6.65)
BSFC KG/KW HR (LB/HP HR)	.317 (.522)	.316 (.520)	.269 (.442)	.304 (.501)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.03 (16.13)
BSHC G/KW HR (G/HP HR)	2.05 (1.53)
BSCO G/KW HR (G/HP HR)	5.00 (3.73)
BSCO2 G/KW HR (G/HP HR)	897 (669)
BSNOX G/KW HR (G/HP HR)	7.16 (5.34)
BSFC KG/KW HR (LB/HP HR)	.287 (.472)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.120 (39.55)
MULTIPLIER FOR	G/TEST	1.070
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0889 (.0663)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3097 (.1405)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.02 (2826.5)

TABLE B-5C. TEST D5-13 EMISSIONS RESULTS
NO. 1 FUEL

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-13 RUN
DATE 8/28/79
TIME 10:38
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 738.89 MM HG(29.09 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 48 PCT
ABSOLUTE HUMIDITY 8.8 GM/KG(61.7 GRAINS/LB)

NOX HUMIDITY C.F. .9410

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)
BLOWER INLET P MM. H2O(IN. H2O)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6265	6372	6202
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	295.5 (10439)	299.5 (10577)	304.6 (10758)	296.5 (10471)
HC SAMPLE METER/RANGE/PPM	30.2/11/ 30	43.8/11/ 44	73.8/11/ 74	31.7/11/ 32
HC BCKGRD METER/RANGE/PPM	9.8/ 1/ 10	10.3/ 1/ 10	10.0/ 1/ 10	10.2/ 1/ 10
CO SAMPLE METER/RANGE/PPM	33.9/13/ 31	38.9/13/ 36	99.6/13/ 101	20.3/13/ 18
CO BCKGRD METER/RANGE/PPM	2.9/13/ 3	2.5/13/ 2	2.5/13/ 2	2.5/13/ 2
CO2 SAMPLE METER/RANGE/PCT	21.2/ 3/ .34	28.1/ 3/ .46	63.1/ 3/ 1.12	17.8/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	2.9/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	27.6/ 2/ 28	31.6/ 2/ 32	79.9/ 2/ 80	22.9/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	.8/ 2/ 1	.8/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	38.49	28.52	11.73	46.30
HC CONCENTRATION PPM	21	34	65	22
CO CONCENTRATION PPM	28	33	96	16
CO2 CONCENTRATION PCT	.30	.42	1.09	.24
NOX CONCENTRATION PPM	26.7	30.8	79.2	22.2
HC MASS GRAMS	3.51	5.86	11.37	3.71
CO MASS GRAMS	9.57	11.47	33.90	5.38
CO2 MASS GRAMS	1601.3	2298.7	6055.6	1317.1
NOX MASS GRAMS	14.22	16.62	43.40	11.85
FUEL KG (LB)	.513 (1.13)	.736 (1.62)	1.937 (4.27)	.422 (.93)
KW HR (HP HR)	1.33 (1.79)	2.03 (2.73)	6.98 (9.36)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	2.64 (1.97)	2.88 (2.15)	1.63 (1.21)	2.71 (2.02)
BSCO G/KW HR (G/HP HR)	7.18 (5.36)	5.64 (4.21)	4.86 (3.62)	3.93 (2.93)
BSCO2 G/KW HR (G/HP HR)	1201.95 (896.30)	1130.45 (842.98)	867.97 (647.24)	963.29 (718.32)
BSNOX G/KW HR (G/HP HR)	10.67 (7.96)	8.17 (6.09)	6.22 (4.64)	8.67 (6.47)
BSFC KG/KW HR (LB/HP HR)	.385 (.633)	.362 (.595)	.278 (.456)	.308 (.507)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.71 (15.70)
BSHC G/KW HR (G/HP HR)	2.09 (1.56)
BSCO G/KW HR (G/HP HR)	5.15 (3.84)
BSCO2 G/KW HR (G/HP HR)	963 (718)
BSNOX G/KW HR (G/HP HR)	7.35 (5.48)
BSFC KG/KW HR (LB/HP HR)	.308 (.507)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	1.134 (40.06)
MULTIPLIER FOR	G/TEST	1.054
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0900 (.0671)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2923 (.1326)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	80.29 (2836.0)

TABLE B-5C (CONT'D). TEST D5-13 EMISSIONS RESULTS
NO. 1 FUEL

HOT TRANSIENT

PROJECT NO. 11-5099-001

ENGINE NO.8V71N
ENGINE MODEL -8 DETROIT DIESEL
ENGINE 8.0 L(-8 CID) V-8
CVS NO. 10

TEST NO.D5-13 RUN
DATE 8/28/79
TIME
DYNO NO. 5

DIESEL EM-900-F
BAG CART NO. 1

BAROMETER 738.89 MM HG(29.09 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 48 PCT
ABSOLUTE HUMIDITY 9.4 GM/KG(66.0 GRAINS/LB)

NOX HUMIDITY C.F. .9593

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)
BLOWER INLET P MM. H2O(IN. H2O)	518.2 (20.4)	518.2 (20.4)	518.2 (20.4)	518.2 (20.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6264	6372	6201
TIME SECONDS	296.0	299.4	305.0	296.4
TOTAL FLOW STD. CU. METRES(SCF)	295.6 (10439)	299.5 (10580)	309.7 (10762)	296.5 (10473)
HC SAMPLE METER/RANGE/PPM	33.8/11/ 34	93.0/11/ 93	68.8/11/ 69	31.2/11/ 31
HC BCKGRD METER/RANGE/PPM	8.8/ 1/ 9	8.4/ 1/ 8	6.1/ 1/ 6	6.7/ 1/ 7
CO SAMPLE METER/RANGE/PPM	25.6/13/ 23	97.5/13/ 95	97.8/13/ 99	22.0/13/ 20
CO BCKGRD METER/RANGE/PPM	2.0/13/ 2	1.7/13/ 1	1.6/13/ 1	1.2/13/ 1
CO2 SAMPLE METER/RANGE/PCT	17.4/ 3/ .29	26.3/ 3/ .43	62.3/ 3/ 1.11	17.7/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	2.4/ 3/ .04	2.8/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	21.8/ 2/ 22	30.8/ 2/ 31	79.8/ 2/ 80	23.0/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	1.1/ 2/ 1	1.2/ 2/ 1	1.2/ 2/ 1	1.2/ 2/ 1
DILUTION FACTOR	15.92	30.53	11.91	16.55
HC CONCENTRATION PPM	25	35	63	25
CO CONCENTRATION PPM	21	92	94	18
CO2 CONCENTRATION PCT	.23	.39	1.07	.25
NOX CONCENTRATION PPM	20.7	29.6	78.7	21.8
HC MASS GRAMS	4.30	6.02	11.12	4.22
CO MASS GRAMS	7.16	14.67	33.52	6.29
CO2 MASS GRAMS	1265.0	2125.0	5968.3	1332.8
NOX MASS GRAMS	11.29	16.29	44.01	11.88
FUEL KG (LB)	.907 (.90)	.683 (1.51)	1.909 (4.21)	.927 (.94)
KW HR (HP HR)	1.92 (1.90)	2.14 (2.94)	7.13 (9.57)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	3.03 (2.26)	2.75 (2.05)	1.56 (1.16)	3.09 (2.30)
BSCO G/KW HR (G/HP HR)	5.05 (3.76)	6.70 (4.99)	4.70 (3.50)	4.60 (3.43)
BSCO2 G/KW HR (G/HP HR)	890.91 (664.36)	969.80 (723.18)	836.54 (623.81)	974.74 (726.90)
BSNOX G/KW HR (G/HP HR)	7.92 (5.90)	7.44 (5.54)	6.17 (4.60)	8.64 (6.48)
BSFC KG/KW HR (LB/HP HR)	.286 (.471)	.312 (.513)	.268 (.440)	.313 (.514)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.11 (16.24)
BSHC G/KW HR (G/HP HR)	2.12 (1.58)
BSCO G/KW HR (G/HP HR)	5.04 (3.80)
BSCO2 G/KW HR (G/HP HR)	883 (658)
BSNOX G/KW HR (G/HP HR)	6.84 (5.14)
BSFC KG/KW HR (LB/HP HR)	.283 (.465)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.094 (38.64)
MULTIPLIER FOR	G/TEST	1.093
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0903 (.0673)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3191 (.1448)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.43 (2840.8)

TABLE B-5D. TEST D5-2 EMISSIONS RESULTS
NO. 2 FUEL

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 8.0 L(-0 CID) V-8
CVS NO. 10

TEST NO. D5-2 RUN
DATE 8/ 7/79
TIME
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 743.46 MM HG(29.27 IN HG)
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)

RELATIVE HUMIDITY 62 PCT
ABSOLUTE HUMIDITY 13.4 GM/KG(93.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0969

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6264	6371	6202
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	297.6 (10510)	301.6 (10651)	306.7 (10833)	298.6 (10546)
HC SAMPLE METER/RANGE/PPM	24.5/11/ 24	39.1/11/ 39	60.0/11/ 60	27.9/11/ 27
HC BCKGRD METER/RANGE/PPM	9.3/ 1/ 9	8.7/ 1/ 9	9.2/ 1/ 9	9.3/ 1/ 9
CO SAMPLE METER/RANGE/PPM	29.9/13/ 27	43.6/13/ 41	69.5/12/ 144	20.5/13/ 18
CO BCKGRD METER/RANGE/PPM	.2/13/ 0	.9/13/ 0	.9/12/ 1	.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	19.9/ 3/ .32	27.8/ 3/ .46	63.0/ 3/ 1.12	17.9/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.9/ 3/ .04	3.9/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	26.5/ 2/ 26	31.7/ 2/ 32	79.9/ 2/ 79	24.3/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	2.1/ 2/ 2	2.0/ 2/ 2	2.2/ 2/ 2	2.0/ 2/ 2
DILUTION FACTOR	41.23	28.85	11.73	46.10
HC CONCENTRATION PPM	15	31	52	18
CO CONCENTRATION PPM	26	39	137	17
CO2 CONCENTRATION PCT	.28	.41	1.08	.24
NOX CONCENTRATION PPM	24.5	29.8	77.9	22.3
HC MASS GRAMS	2.64	5.34	9.12	3.16
CO MASS GRAMS	8.91	13.71	48.97	6.01
CO2 MASS GRAMS	1507.6	2285.5	6039.2	1319.2
NOX MASS GRAMS	15.27	18.84	49.81	14.00
FUEL KG (LB)	.478 (1.05)	.727 (1.60)	1.922 (4.24)	.419 (.92)
KW HR (HP HR)	1.42 (1.90)	2.07 (2.77)	7.10 (9.52)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	1.86 (1.39)	2.58 (1.93)	1.28 (.96)	2.31 (1.72)
BSCO G/KW HR (G/HP HR)	6.27 (4.68)	6.63 (4.94)	6.90 (5.14)	4.39 (3.28)
BSCO2 G/KW HR (G/HP HR)	1061.80 (791.78)	1104.92 (823.94)	850.67 (634.34)	964.86 (719.49)
BSNOX G/KW HR (G/HP HR)	10.75 (8.02)	9.11 (6.79)	7.02 (5.23)	10.24 (7.63)
BSFC KG/KW HR (LB/HP HR)	.337 (.554)	.351 (.578)	.271 (.445)	.306 (.503)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.96 (16.03)
BSHC G/KW HR (G/HP HR)	1.70 (1.26)
BSCO G/KW HR (G/HP HR)	6.49 (4.84)
BSCO2 G/KW HR (G/HP HR)	933 (696)
BSNOX G/KW HR (G/HP HR)	8.19 (6.11)
BSFC KG/KW HR (LB/HP HR)	.297 (.488)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.017 (35.93)
MULTIPLIER FOR	G/TEST	1.184
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0990 (.0738)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3339 (.1515)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.38 (2839.0)

TABLE B-5D (CONT'D). TEST D5-2 EMISSIONS RESULTS
NO. 2 FUEL

HOT TRANSIENT 1 — PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -8 DIESEL 8V71N
ENGINE 8.8 L(-8 CID) V-8
CVS NO. 10

TEST NO. D5-2 RUN
DATE 8/ 7/79
TIME 01130
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 743.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 12.0 GM/KG(84.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0446

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6264	6371	6202
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	297.5 (10508)	301.5 (10649)	306.7 (10831)	298.5 (10544)
HC SAMPLE METER/RANGE/PPM	31.7/11/ 32	37.6/11/ 38	58.2/11/ 58	26.1/11/ 26
HC BCKGRD METER/RANGE/PPM	8.3/ 1/ 8	7.9/ 1/ 8	8.0/ 1/ 8	8.0/ 1/ 8
CO SAMPLE METER/RANGE/PPM	25.9/13/ 23	46.1/13/ 43	55.0/12/ 118	20.5/13/ 18
CO BCKGRD METER/RANGE/PPM	1.5/13/ 1	.2/13/ 0	.3/12/ 1	.2/13/ 0
CO2 SAMPLE METER/RANGE/PCT	18.1/ 3/ .29	26.8/ 3/ .44	61.5/ 3/ 1.09	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.8/ 3/ .04	3.4/ 3/ .05	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	24.2/ 2/ 24	31.7/ 2/ 32	77.8/ 2/ 78	23.7/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	1.8/ 2/ 2	1.5/ 2/ 2	1.6/ 2/ 2	1.5/ 2/ 2
DILUTION FACTOR	45.43	29.98	12.07	45.33
HC CONCENTRATION PPM	24	30	51	18
CO CONCENTRATION PPM	21	42	113	18
CO2 CONCENTRATION PCT	.29	.40	1.05	.24
NOX CONCENTRATION PPM	22.4	30.3	76.3	22.2
HC MASS GRAMS	4.05	5.22	9.00	3.15
CO MASS GRAMS	7.43	14.67	40.49	6.13
CO2 MASS GRAMS	1332.9	2195.7	5868.8	1313.5
NOX MASS GRAMS	13.34	18.22	46.77	13.26
FUEL KG (LB)	.425 (.94)	.699 (1.54)	1.864 (4.11)	.417 (.92)
KW HR (HP HR)	1.44 (1.93)	2.21 (2.96)	7.20 (9.66)	1.38 (1.86)
BSHC G/KW HR (G/HP HR)	2.82 (2.10)	2.36 (1.76)	1.25 (.93)	2.28 (1.70)
BSCO G/KW HR (G/HP HR)	5.17 (3.86)	6.64 (4.95)	5.62 (4.19)	4.43 (3.30)
BSCO2 G/KW HR (G/HP HR)	927.28 (691.47)	994.13 (741.32)	814.59 (607.44)	948.53 (707.32)
BSNOX G/KW HR (G/HP HR)	9.28 (6.92)	8.25 (6.15)	6.49 (4.84)	9.58 (7.14)
BSFC KG/KW HR (LB/HP HR)	.295 (.486)	.317 (.520)	.259 (.425)	.301 (.495)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.24 (16.41)
BSHC G/KW HR (G/HP HR)	1.75 (1.31)
BSCO G/KW HR (G/HP HR)	5.62 (4.19)
BSCO2 G/KW HR (G/HP HR)	875 (653)
BSNOX G/KW HR (G/HP HR)	7.49 (5.58)
BSFC KG/KW HR (LB/HP HR)	.278 (.457)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.051 (37.13)
MULTIPLIER FOR	G/TEST	1.195
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0936 (.0698)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3369 (.1526)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.60 (2846.9)

TABLE B-5E. TEST D5-4 EMISSIONS RESULTS
NO. 2 FUEL

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-4 RUN
DATE 8/ 9/79
TIME 10:33 — DIESEL EM-321-F
DYNO NO. 5 — BAG CART NO. 1

BAROMETER 746.51 MM HG(29.39 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 63 PCT
ABSOLUTE HUMIDITY 11.9 GM/KG(83.4 GRAINS/LB) — NOx HUMIDITY C.F. 1.0409

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6269	6371	6202
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.0 (10559)	303.0 (10701)	308.1 (10883)	300.0 (10595)
HC SAMPLE METER/RANGE/PPM	28.9/11/ 28	41.5/11/ 42	61.6/11/ 62	27.3/11/ 27
HC BCKGRD METER/RANGE/PPM	9.9/ 1/ 10	9.5/ 1/ 10	9.3/ 1/ 9	9.0/ 1/ 9
CO SAMPLE METER/RANGE/PPM	31.8/13/ 29	39.9/13/ 37	64.7/12/ 144	21.3/13/ 19
CO BCKGRD METER/RANGE/PPM	.9/13/ 0	.1/13/ 0	.1/12/ 0	.1/13/ 0
CO2 SAMPLE METER/RANGE/PCT	21.9/ 3/ .35	28.1/ 3/ .46	65.5/ 3/ 1.17	18.5/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.5/ 3/ .05	3.5/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	27.1/ 2/ 27	31.0/ 2/ 31	81.8/ 2/ 82	23.5/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	2.0/ 2/ 2	1.7/ 2/ 2	1.6/ 2/ 2	1.5/ 2/ 2
DILUTION FACTOR	38.16	28.53	11.23	19.54
HC CONCENTRATION PPM	19	32	53	19
CO CONCENTRATION PPM	28	36	138	18
CO2 CONCENTRATION PCT	.30	.41	1.12	.25
NOX CONCENTRATION PPM	25.2	29.9	80.3	22.0
HC MASS GRAMS	3.23	5.66	9.49	3.21
CO MASS GRAMS	9.66	12.58	49.49	6.93
CO2 MASS GRAMS	1630.3	2275.9	6393.8	1356.1
NOX MASS GRAMS	14.97	17.71	49.29	13.16
FUEL KG (LB)	.518 (1.14)	.729 (1.60)	2.018 (4.45)	.430 (.95)
KW HR (HP HR)	1.42 (1.90)	2.05 (2.75)	7.20 (9.66)	1.42 (1.90)
BSHC G/KW HR (G/HP HR)	2.27 (1.70)	2.76 (2.06)	1.31 (.98)	2.26 (1.69)
BSCO G/KW HR (G/HP HR)	6.81 (5.07)	6.13 (4.57)	6.87 (5.12)	4.53 (3.37)
BSCO2 G/KW HR (G/HP HR)	1148.17 (856.19)	1109.67 (827.48)	880.52 (656.60)	955.07 (712.19)
BSNOx G/KW HR (G/HP HR)	10.54 (7.86)	8.64 (6.44)	6.84 (5.10)	9.27 (6.91)
BSFC KG/KW HR (LB/HP HR)	.365 (.544)	.353 (.580)	.280 (.460)	.303 (.448)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.10 (16.22)
BSHC G/KW HR (G/HP HR)	1.78 (1.33)
BSCO G/KW HR (G/HP HR)	6.46 (4.82)
BSCO2 G/KW HR (G/HP HR)	960 (716)
BSNOX G/KW HR (G/HP HR)	7.87 (5.87)
BSFC KG/KW HR (LB/HP HR)	.385 (.581)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.052 (37.15)
MULTIPLIER FOR	G/TEST	1.150
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0951 (.0709)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3118 (.1414)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.93 (2858.5)

TABLE B-5E (CONT'D). TEST D5-4 EMISSIONS RESULTS
NO. 2 FUEL

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-4 RUN
DATE 8/ 9/79
TIME 11:13
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 64 PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0500

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180	6263	6372	6202
TIME SECONDS	296.0	299.9	305.0	298.0
TOTAL FLOW STD. CU. METRES(SCF)	298.8 (10553)	302.8 (10695)	308.1 (10881)	299.9 (10592)
HC SAMPLE METER/RANGE/PPM	30.5/11/ 31	38.7/11/ 39	58.9/11/ 59	27.1/11/ 27
HC BCKGRD METER/RANGE/PPM	11.0/ 1/ 11	9.9/ 1/ 10	8.3/ 1/ 8	8.1/ 1/ 8
CO SAMPLE METER/RANGE/PPM	26.1/13/ 23	52.9/13/ 50	54.1/12/ 116	20.7/13/ 18
CO BCKGRD METER/RANGE/PPM	.1/13/ 0	.1/13/ 0	.1/12/ 0	.1/13/ 0
CO2 SAMPLE METER/RANGE/PCT	18.3/ 3/ .29	27.0/ 3/ .44	61.5/ 3/ 1.09	17.9/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	2.8/ 3/ .04	3.2/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	23.3/ 2/ 23	32.4/ 2/ 32	78.0/ 2/ 78	23.4/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	1.3/ 2/ 1	1.3/ 2/ 1	1.3/ 2/ 1	1.4/ 2/ 1
DILUTION FACTOR	44.93	29.69	12.07	46.10
HC CONCENTRATION PPM	20	29	51	19
CO CONCENTRATION PPM	23	48	111	18
CO2 CONCENTRATION PCT	.24	.40	1.05	.24
NOX CONCENTRATION PPM	22.0	31.1	76.8	22.0
HC MASS GRAMS	3.40	5.09	9.11	3.32
CO MASS GRAMS	7.91	16.96	39.88	6.23
CO2 MASS GRAMS	1315.7	2229.8	5912.0	1300.0
NOX MASS GRAMS	13.22	18.94	47.53	13.27
FUEL KG (LB)	.419 (.92)	.709 (1.56)	1.877 (4.14)	.413 (.91)
KW HR (HP HR)	1.44 (1.93)	2.14 (2.94)	7.14 (9.64)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	2.37 (1.77)	2.32 (1.73)	1.27 (.95)	2.43 (1.81)
BSCO G/KW HR (G/HP HR)	5.50 (4.10)	7.74 (5.77)	5.55 (4.14)	4.56 (3.40)
BSCO2 G/KW HR (G/HP HR)	915.36 (682.58)	1015.34 (757.14)	822.60 (613.41)	950.81 (709.02)
BSNOX G/KW HR (G/HP HR)	9.20 (6.86)	8.65 (6.45)	6.61 (4.93)	9.71 (7.24)
BSFC KG/KW HR (LB/HP HR)	.291 (.479)	.324 (.532)	.261 (.429)	.302 (.496)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.18 (16.34)
BSHC G/KW HR (G/HP HR)	1.72 (1.28)
BSCO G/KW HR (G/HP HR)	5.83 (4.35)
BSCO2 G/KW HR (G/HP HR)	883 (658)
BSNOX G/KW HR (G/HP HR)	7.63 (5.69)
BSFC KG/KW HR (LB/HP HR)	.281 (.461)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.046 (36.96)
MULTIPLIER FOR	G/TEST	1.156
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0949 (.0708)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3382 (.1534)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.98 (2860.2)

TABLE B-6A. TEST D6-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL -0 DETROIT 6V92TA
ENGINE 0.0 L(-0 CID) V-6
CVS NO. 10

TEST NO.D6-2 RUN
DATE 10/ 3/79
TIME 09:15
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 741.17 MM HG(29.18 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 57 PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0034

BAG RESULTS	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)
BLOWER INLET P MM. H2O(IN. H2O)	518.2 (20.4)	518.2 (20.4)	518.2 (20.4)	518.2 (20.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180	6262	6371	6201
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	296.9 (10468)	300.3 (10607)	305.5 (10791)	297.9 (10503)
HC SAMPLE METER/RANGE/PPM	20.6/11/ 21	26.7/11/ 27	48.5/11/ 49	25.1/11/ 25
HC BCKGRD METER/RANGE/PPM	7.2/ 1/ 7	7.5/ 1/ 8	7.0/ 1/ 7	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	18.9/13/ 17	18.1/13/ 16	26.6/13/ 24	22.8/13/ 20
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2	2.0/13/ 2	2.6/13/ 2	2.6/13/ 2
CO2 SAMPLE METER/RANGE/PCT	20.9/ 3/ .33	25.3/ 3/ .41	56.1/ 3/ .99	18.5/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.6/ 3/ .06	3.9/ 3/ .06	3.8/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	20.5/ 2/ 20	25.4/ 2/ 25	73.9/ 2/ 74	23.6/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	1.0/ 2/ 1	.9/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	40.35	32.13	13.99	44.55
HC CONCENTRATION PPM	14	14	42	18
CO CONCENTRATION PPM	15	14	21	18
CO2 CONCENTRATION PCT	.28	.36	.93	.24
NOX CONCENTRATION PPM	19.3	24.4	73.1	22.7
HC MASS GRAMS	2.33	3.37	7.41	3.14
CO MASS GRAMS	5.10	4.88	7.46	6.13
CO2 MASS GRAMS	1498.7	1976.2	5206.2	1303.1
NOX MASS GRAMS	11.00	14.08	42.85	12.97
FUEL KG (LB)	.477 (1.05)	.629 (1.39)	1.652 (3.64)	.417 (.92)
KW HR (HP HR)	1.07 (1.43)	1.81 (2.42)	6.43 (8.63)	1.31 (1.76)
BSHC G/KW HR (G/HP HR)	2.17 (1.62)	1.86 (1.39)	1.15 (.86)	2.39 (1.78)
BSCO G/KW HR (G/HP HR)	4.77 (3.56)	2.70 (2.02)	1.16 (.86)	4.66 (3.48)
BSCO2 G/KW HR (G/HP HR)	1401.54 (1045.13)	1094.55 (816.21)	809.25 (603.46)	991.19 (739.13)
BSNOX G/KW HR (G/HP HR)	10.28 (7.67)	7.80 (5.82)	6.66 (4.97)	9.86 (7.36)
BSFC KG/KW HR (LB/HP HR)	.446 (.734)	.348 (.573)	.257 (.422)	.317 (.521)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	10.62 (14.25)
BSHC G/KW HR (G/HP HR)	1.53 (1.14)
BSCO G/KW HR (G/HP HR)	2.22 (1.65)
BSCO2 G/KW HR (G/HP HR)	940 (701)
BSNOX G/KW HR (G/HP HR)	7.61 (5.68)
BSFC KG/KW HR (LB/HP HR)	.299 (.491)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.228 (43.36)
MULTIPLIER FOR	G/TEST	.977
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0920 (.0686)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3077 (.1396)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.93 (2823.2)

TABLE B-6A (CONT'D). TEST D6-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO,6V92T
ENGINE MODEL =D DETROIT 6V92TA
ENGINE D,D L(=D CID) V=6
CVS NO, 10

TEST NO,D6-2 RUN
DATE 10/ 3/79
TIME 09:55
DYNO NO, 5

DIESEL EM-400-F
BAG CART NO, 1

BAROMETER 741.17 MM HG(29.18 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 57 PCT
ABSOLUTE HUMIDITY 10.5 GM/KG(73.7 GRAINS/LB)

NOX HUMIDITY C.F. .9921

BAG RESULTS	1	2	3	4
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	642.6 (25.3)	642.6 (25.3)	642.6 (25.3)	642.6 (25.3)
BLOWER INLET P MM. H2O(IN. H2O)	518.2 (20.4)	518.2 (20.4)	518.2 (20.4)	518.2 (20.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6178	6261	6371	6201
TIME SECONDS	295.9	300.3	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	296.5 (10474)	300.5 (10615)	305.8 (10801)	297.7 (10513)
HC SAMPLE METER/RANGE/PPM	24.2/11/ 24	31.9/11/ 32	52.5/11/ 53	31.5/11/ 32
HC BCKGRD METER/RANGE/PPM	8.3/ 1/ 8	10.8/ 1/ 11	13.5/ 1/ 13	13.9/ 1/ 14
CO SAMPLE METER/RANGE/PPM	22.1/13/ 20	17.9/13/ 15	25.9/13/ 23	22.1/13/ 20
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2	1.9/13/ 2	1.8/13/ 2	1.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	18.4/ 3/ .29	25.0/ 3/ .41	56.6/ 3/ .98	17.9/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	4.2/ 3/ .06	3.8/ 3/ .06	4.0/ 3/ .06	3.7/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	22.9/ 2/ 23	29.2/ 2/ 29	76.9/ 2/ 77	22.7/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	1.1/ 2/ 1	1.0/ 2/ 1	1.1/ 2/ 1	1.0/ 2/ 1
DILUTION FACTOR	44.83	32.50	13.62	46.01
HC CONCENTRATION PPM	16	21	40	18
CO CONCENTRATION PPM	18	13	21	18
CO2 CONCENTRATION PCT	.23	.35	.92	.23
NOX CONCENTRATION PPM	21.8	28.2	75.9	21.7
HC MASS GRAMS	2.75	3.71	7.05	3.08
CO MASS GRAMS	6.10	4.70	7.47	6.21
CO2 MASS GRAMS	1259.3	1932.4	5147.8	1267.4
NOX MASS GRAMS	12.28	16.10	44.04	12.27
FUEL KG (LB)	.402 (.89)	.615 (1.36)	1.634 (3.60)	.403 (.89)
KW HR (HP HR)	1.37 (1.83)	2.00 (2.68)	6.35 (8.51)	1.31 (1.76)
BSHC G/KW HR (G/HP HR)	2.01 (1.50)	1.86 (1.39)	1.11 (.83)	2.34 (1.74)
BSCO G/KW HR (G/HP HR)	4.46 (3.32)	2.35 (1.75)	1.18 (.88)	4.72 (3.52)
BSCO2 G/KW HR (G/HP HR)	919.57 (685.72)	967.01 (721.10)	811.23 (604.93)	956.39 (713.18)
BSNOX G/KW HR (G/HP HR)	8.98 (6.70)	8.06 (6.01)	6.94 (5.18)	9.33 (6.96)
BSFC KG/KW HR (LB/HP HR)	.294 (.483)	.308 (.506)	.257 (.423)	.306 (.503)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.03 (14.79)	
BSHC G/KW HR (G/HP HR)	1.50 (1.12)	
BSCO G/KW HR (G/HP HR)	2.22 (1.65)	
BSCO2 G/KW HR (G/HP HR)	870 (649)	
BSNOX G/KW HR (G/HP HR)	7.68 (5.73)	
BSFC KG/KW HR (LB/HP HR)	.277 (.455)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	1.251 (44.19)
MULTIPLIER FOR	G/TEST	.960
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0870 (.0649)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3142 (.1425)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	80.82 (2854.6)

TABLE B-6B. TEST D6-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL -0 DETROIT 6V92TA
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D6-3 RUN
DATE 10/ 4/79
TIME 10:30
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 747.52 MM HG(29.43 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 10.2 GM/KG(71.3 GRAINS/LB)

NOX HUMIDITY C.F. .9827

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179	6262	6371	6200
TIME SECONDS	295.9	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	299.3 (10571)	303.3 (10713)	308.6 (10899)	300.3 (10607)
HC SAMPLE METER/RANGE/PPM	22.0/11/ 22	28.4/11/ 28	50.5/11/ 50	25.3/11/ 25
HC BCKGRD METER/RANGE/PPM	6.0/ 1/ 6	6.2/ 1/ 6	6.0/ 1/ 6	5.9/ 1/ 6
CO SAMPLE METER/RANGE/PPM	18.6/13/ 16	16.3/13/ 14	23.5/13/ 21	19.8/13/ 18
CO BCKGRD METER/RANGE/PPM	1.3/13/ 1	1.1/13/ 1	1.2/13/ 1	1.2/13/ 1
CO2 SAMPLE METER/RANGE/PCT	17.8/ 3/ .28	23.1/ 3/ .37	54.0/ 3/ .94	17.4/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	2.7/ 3/ .04	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	19.9/ 2/ 20	25.2/ 2/ 25	77.2/ 2/ 77	24.4/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	1.4/ 2/ 1	1.4/ 2/ 1	1.3/ 2/ 1	1.3/ 2/ 1
DILUTION FACTOR	46.48	35.36	14.08	47.51
HC CONCENTRATION PPM	16	22	45	19
CO CONCENTRATION PPM	15	13	19	16
CO2 CONCENTRATION PCT	.24	.33	.91	.24
NOX CONCENTRATION PPM	18.5	23.8	76.0	23.1
HC MASS GRAMS	2.78	3.92	7.99	3.38
CO MASS GRAMS	5.24	4.64	6.93	5.66
CO2 MASS GRAMS	1313.1	1841.7	5122.2	1313.8
NOX MASS GRAMS	10.43	13.59	44.08	13.06
FUEL KG (LB)	.419 (.92)	.587 (1.29)	1.626 (3.59)	.420 (.93)
KW HR (HP HR)	1.05 (1.41)	1.81 (2.42)	6.56 (8.79)	1.35 (1.81)
BSHC G/KW HR (G/HP HR)	2.65 (1.97)	2.17 (1.62)	1.22 (.91)	2.50 (1.87)
BSCO G/KW HR (G/HP HR)	4.98 (3.71)	2.57 (1.92)	1.06 (.79)	4.19 (3.13)
BSCO2 G/KW HR (G/HP HR)	1248.46 (930.98)	1020.05 (760.65)	781.30 (582.62)	973.32 (725.81)
BSNOX G/KW HR (G/HP HR)	9.91 (7.39)	7.53 (5.61)	6.72 (5.01)	9.67 (7.21)
BSFC KG/KW HR (LB/HP HR)	.399 (.655)	.325 (.534)	.248 (.408)	.311 (.512)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	10.76 (	14.43)
BSHC G/KW HR (G/HP HR)	1.68 (	1.25)
BSCO G/KW HR (G/HP HR)	2.09 (	1.56)
BSCO2 G/KW HR (G/HP HR)	891 (	664)
BSNOX G/KW HR (G/HP HR)	7.54 (	5.62)
BSFC KG/KW HR (LB/HP HR)	.284 (	.466)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.250 (44.14)
MULTIPLIER FOR	G/TEST	.969
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0901 (.0672)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3176 (.1441)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.72 (2886.2)

TABLE B-6B (CONT'D). TEST D6-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL -0 DETROIT 6V92TA
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D6-3 RUN
DATE 10/ 4/79
TIME
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 747.52 MM HG(29.43 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 10.6 GM/KG(74.4 GRAINS/LB)

NOX HUMIDITY C.F. .9971

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	640.1 (25.2)	640.1 (25.2)	640.1 (25.2)	640.1 (25.2)
BLOWER INLET P MM. H2O(IN. H2O)	515.6 (20.3)	515.6 (20.3)	515.6 (20.3)	515.6 (20.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180	6263	6372	6201
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	299.6 (10583)	303.7 (10725)	308.9 (10912)	300.7 (10619)
HC SAMPLE METER/RANGE/PPM	23.7/11/ 24	29.1/11/ 29	49.6/11/ 50	26.0/11/ 26
HC BCKGRD METER/RANGE/PPM	6.9/ 1/ 7	6.5/ 1/ 7	6.5/ 1/ 7	6.0/ 1/ 6
CO SAMPLE METER/RANGE/PPM	18.4/13/ 16	14.8/13/ 13	22.6/13/ 20	19.8/13/ 18
CO BCKGRD METER/RANGE/PPM	.5/13/ 0	.5/13/ 0	1.4/13/ 1	1.0/13/ 1
CO2 SAMPLE METER/RANGE/PCT	17.4/ 3/ .28	23.7/ 3/ .39	55.0/ 3/ .96	17.4/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.0/ 3/ .05	2.9/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	24.3/ 2/ 24	29.9/ 2/ 30	80.9/ 2/ 81	25.0/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	1.4/ 2/ 1	1.0/ 2/ 1	.9/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	47.56	34.43	13.80	47.50
HC CONCENTRATION PPM	17	23	44	20
CO CONCENTRATION PPM	16	12	18	16
CO2 CONCENTRATION PCT	.23	.34	.92	.23
NOX CONCENTRATION PPM	22.9	28.9	80.1	24.1
HC MASS GRAMS	2.93	4.00	7.76	3.50
CO MASS GRAMS	5.41	4.35	6.59	5.72
CO2 MASS GRAMS	1286.0	1893.4	5223.1	1273.7
NOX MASS GRAMS	13.11	16.76	47.18	13.83
FUEL KG (LB)	.411 (.91)	.603 (1.33)	1.658 (3.65)	.408 (.90)
KW HR (HP HR)	1.40 (1.88)	2.07 (2.77)	6.54 (8.77)	1.33 (1.79)
BSHC G/KW HR (G/HP HR)	2.09 (1.56)	1.93 (1.44)	1.19 (.88)	2.63 (1.96)
BSCO G/KW HR (G/HP HR)	3.86 (2.88)	2.10 (1.57)	1.01 (.75)	4.30 (3.20)
BSCO2 G/KW HR (G/HP HR)	917.05 (683.85)	915.36 (682.59)	798.83 (595.69)	956.10 (712.96)
BSNOX G/KW HR (G/HP HR)	9.35 (6.97)	8.10 (6.04)	7.22 (5.38)	10.38 (7.74)
BSFC KG/KW HR (LB/HP HR)	.293 (.482)	.292 (.479)	.254 (.417)	.306 (.503)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.34 (15.21)
BSHC G/KW HR (G/HP HR)	1.60 (1.20)
BSCO G/KW HR (G/HP HR)	1.95 (1.45)
BSCO2 G/KW HR (G/HP HR)	853 (636)
BSNOX G/KW HR (G/HP HR)	8.01 (5.98)
BSFC KG/KW HR (LB/HP HR)	.272 (.446)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.241 (43.82)
MULTIPLIER FOR	G/TEST	.978
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0862 (.0643)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3175 (.1440)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.08 (2899.2)

TABLE B-6C. TEST D6-5 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 79 DETROIT 6V92TA
ENGINE 8.0 L(490 CID) V-8
CVS NO. 10

TEST NO.D6-5 RUN
DATE 10/ 9/79
TIME 09:20
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 740.16 MM HG(29.14 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 10.3 GM/KG(72.2 GRAINS/LB)

NOX HUMIDITY C.F. .9872

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)
BLOWER INLET P MM. H2O(IN. H2O)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6264	6372	6202
TIME SECONDS	296.0	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	296.7 (10480)	300.7 (10621)	305.9 (10804)	297.7 (10516)
HC SAMPLE METER/RANGE/PPM	19.9/11/ 20	27.5/11/ 28	47.6/11/ 48	25.2/11/ 25
HC BCKGRD METER/RANGE/PPM	4.7/ 1/ 5	4.8/ 1/ 5	4.1/ 1/ 4	4.0/ 1/ 4
CO SAMPLE METER/RANGE/PPM	30.4/13/ 28	18.7/13/ 17	24.1/13/ 22	26.4/13/ 24
CO BCKGRD METER/RANGE/PPM	2.2/13/ 2	2.1/13/ 2	1.4/13/ 1	1.5/13/ 1
CO2 SAMPLE METER/RANGE/PCT	19.9/ 3/ .32	25.2/ 3/ .41	59.7/ 3/ .96	17.7/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	21.7/ 2/ 22	28.0/ 2/ 28	77.2/ 2/ 77	24.8/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	1.1/ 2/ 1	1.0/ 2/ 1	1.0/ 2/ 1
DILUTION FACTOR	41.28	32.25	13.88	46.58
HC CONCENTRATION PPM	15	23	44	21
CO CONCENTRATION PPM	25	14	20	22
CO2 CONCENTRATION PCT	.28	.37	.92	.24
NOX CONCENTRATION PPM	20.5	26.9	76.3	23.8
HC MASS GRAMS	2.63	3.97	7.73	3.65
CO MASS GRAMS	8.65	5.05	7.01	7.60
CO2 MASS GRAMS	1503.3	2035.3	5146.4	1313.6
NOX MASS GRAMS	11.50	15.29	44.06	13.39
FUEL KG (LB)	.477 (1.05)	.643 (1.42)	1.621 (3.57)	.418 (.92)
KW HR (HP HR)	1.35 (1.81)	2.00 (2.68)	7.03 (9.43)	1.42 (1.90)
BSHC G/KW HR (G/HP HR)	1.95 (1.45)	1.98 (1.48)	1.10 (.82)	2.57 (1.92)
BSCO G/KW HR (G/HP HR)	6.41 (4.78)	2.53 (1.88)	1.00 (.74)	5.35 (3.99)
BSCO2 G/KW HR (G/HP HR)	1113.77 (830.54)	1018.50 (759.49)	732.14 (545.96)	925.13 (689.87)
BSNOX G/KW HR (G/HP HR)	8.52 (6.36)	7.65 (5.71)	6.27 (4.67)	9.43 (7.03)
BSFC KG/KW HR (LB/HP HR)	.353 (.581)	.322 (.529)	.231 (.379)	.295 (.484)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.80 (15.82)
BSHC G/KW HR (G/HP HR)	1.52 (1.14)
BSCO G/KW HR (G/HP HR)	2.40 (1.79)
BSCO2 G/KW HR (G/HP HR)	848 (632)
BSNOX G/KW HR (G/HP HR)	7.14 (5.33)
BSFC KG/KW HR (LB/HP HR)	.268 (.440)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.893 (31.55)
MULTIPLIER FOR	G/TEST	1.345
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1140 (.0850)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4257 (.1931)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	80.82 (2854.5)

TABLE B-6C (CONT'D). TEST D6-5 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 79 DETROIT 6V92TA
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D6-5 RUN
DATE 10/ 9/79
TIME 10:05
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 740.16 MM HG(29.14 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.2 GRAINS/LB)

NOX HUMIDITY C.F. .9734

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179	6262	6372	6200
TIME SECONDS	295.9	299.8	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	296.7 (10478)	300.6 (10619)	305.9 (10805)	297.7 (10513)
HC SAMPLE METER/RANGE/PPM	24.2/11/ 24	29.1/11/ 29	47.1/11/ 47	25.6/11/ 26
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5	4.9/ 1/ 5	4.3/ 1/ 4	4.0/ 1/ 4
CO SAMPLE METER/RANGE/PPM	25.5/13/ 23	22.4/13/ 20	24.8/13/ 22	28.5/13/ 26
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2	1.9/13/ 2	1.9/13/ 2	2.0/13/ 2
CO2 SAMPLE METER/RANGE/PCT	18.4/ 3/ .29	25.9/ 3/ .42	56.7/ 3/ 1.00	18.9/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.1/ 3/ .05	2.8/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	24.7/ 2/ 25	32.5/ 2/ 33	83.9/ 2/ 84	25.6/ 2/ 26
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	1.2/ 2/ 1	1.2/ 2/ 1	1.3/ 2/ 1
DILUTION FACTOR	44.78	31.30	13.34	43.50
HC CONCENTRATION PPM	19	24	43	22
CO CONCENTRATION PPM	21	18	20	23
CO2 CONCENTRATION PCT	.25	.38	.96	.26
NOX CONCENTRATION PPM	23.5	31.3	82.8	24.3
HC MASS GRAMS	3.28	4.22	7.60	3.72
CO MASS GRAMS	7.17	6.27	7.09	8.12
CO2 MASS GRAMS	1364.8	2077.6	5367.5	1415.5
NOX MASS GRAMS	13.00	17.54	47.16	13.48
FUEL KG (LB)	.434 (.96)	.657 (1.45)	1.690 (3.72)	.450 (.99)
KW HR (HP HR)	1.45 (1.95)	2.23 (2.99)	7.03 (9.43)	1.40 (1.88)
BSHC G/KW HR (G/HP HR)	2.25 (1.68)	1.89 (1.41)	1.08 (.81)	2.65 (1.98)
BSCO G/KW HR (G/HP HR)	4.93 (3.67)	2.81 (2.10)	1.01 (.75)	5.79 (4.32)
BSCO2 G/KW HR (G/HP HR)	938.02 (699.48)	933.25 (695.93)	763.59 (569.41)	1009.39 (752.70)
BSNOX G/KW HR (G/HP HR)	8.93 (6.66)	7.88 (5.88)	6.71 (5.00)	9.62 (7.17)
BSFC KG/KW HR (LB/HP HR)	.298 (.490)	.295 (.485)	.240 (.395)	.321 (.528)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.11 (16.24)
BSHC G/KW HR (G/HP HR)	1.55 (1.16)
BSCO G/KW HR (G/HP HR)	2.36 (1.76)
BSCO2 G/KW HR (G/HP HR)	844 (630)
BSNOX G/KW HR (G/HP HR)	7.53 (5.61)
BSFC KG/KW HR (LB/HP HR)	.267 (.438)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.897 (31.68)
MULTIPLIER FOR	G/TEST	1.339
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1105 (.0824)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4144 (.1880)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.49 (2842.8)

TABLE B-6D. TEST D6-6 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 79 DETROIT 6V92TA
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D6-6 RUN
DATE 10/10/79
TIME 02:08 — DIESEL EM-321-F
DYNO NO. 5 — BAG CART NO. 1

BAROMETER 743.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 9.8 GM/KG(68.3 GRAINS/LB) — NOX HUMIDITY C.F. .9695

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)	635.0 (25.0)
BLOWER INLET P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180	6264	6372	6201
TIME SECONDS	295.9	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	297.9 (10522)	301.9 (10665)	307.2 (10849)	298.9 (10558)
HC SAMPLE METER/RANGE/PPM	17.7/11/ 18	24.0/11/ 24	43.6/11/ 44	22.9/11/ 23
HC BCKGRD METER/RANGE/PPM	5.7/ 1/ 6	6.4/ 1/ 6	6.1/ 1/ 6	6.0/ 1/ 6
CO SAMPLE METER/RANGE/PPM	30.0/13/ 27	18.0/13/ 16	24.7/13/ 22	25.5/13/ 23
CO BCKGRD METER/RANGE/PPM	1.2/13/ 1	1.0/13/ 1	1.1/13/ 1	1.1/13/ 1
CO2 SAMPLE METER/RANGE/PCT	17.9/ 3/ .29	26.9/ 3/ .44	56.5/ 3/ .99	17.8/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	21.0/ 2/ 21	29.9/ 2/ 30	86.1/ 2/ 86	25.6/ 2/ 26
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.5/ 2/ 1	.5/ 2/ 1	.6/ 2/ 1
DILUTION FACTOR	46.11	30.13	13.90	46.36
HC CONCENTRATION PPM	12	18	38	17
CO CONCENTRATION PPM	26	15	20	21
CO2 CONCENTRATION PCT	.24	.40	.95	.24
NOX CONCENTRATION PPM	20.4	29.4	85.6	25.0
HC MASS GRAMS	2.08	3.09	6.73	2.94
CO MASS GRAMS	8.85	5.17	7.32	7.46
CO2 MASS GRAMS	1299.7	2208.7	5358.9	1319.7
NOX MASS GRAMS	11.28	16.47	48.78	13.87
FUEL KG (LB)	.413 (.91)	.696 (1.54)	1.686 (3.72)	.419 (.92)
KW HR (HP HR)	1.28 (1.72)	1.86 (2.49)	6.82 (9.14)	1.38 (1.86)
BSHC G/KW HR (G/HP HR)	1.62 (1.21)	1.67 (1.24)	.99 (.74)	2.12 (1.58)
BSCO G/KW HR (G/HP HR)	6.92 (5.16)	2.78 (2.08)	1.07 (.80)	5.39 (4.02)
BSCO2 G/KW HR (G/HP HR)	1015.69 (757.40)	1188.66 (886.38)	785.89 (586.04)	953.00 (710.66)
BSNOX G/KW HR (G/HP HR)	8.81 (6.57)	8.87 (6.61)	7.15 (5.33)	10.01 (7.47)
BSFC KG/KW HR (LB/HP HR)	.323 (.530)	.375 (.616)	.247 (.407)	.303 (.498)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.34 (15.21)
BSHC G/KW HR (G/HP HR)	1.31 (.98)
BSCO G/KW HR (G/HP HR)	2.54 (1.89)
BSCO2 G/KW HR (G/HP HR)	898 (670)
BSNOX G/KW HR (G/HP HR)	7.97 (5.94)
BSFC KG/KW HR (LB/HP HR)	.293 (.466)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.867 (30.63)
MULTIPLIER FOR	G/TEST	1.391
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1226 (.0914)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4326 (.1962)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.66 (2884.4)

TABLE B-6D (CONT'D). TEST D6-6 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.6V92T
ENGINE MODEL 79 DETROIT 6V92TA
ENGINE 8.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D6-6 RUN
DATE 10/10/79
TIME 02:48
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 743.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 10.3 GM/KG(72.9 GRAINS/LB)

NOX HUMIDITY C.F. .9879

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	640.1 (25.2)	640.1 (25.2)	640.1 (25.2)	640.1 (25.2)
BLOWER INLET P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6266	6372	6201
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	297.8 (10520)	301.9 (10663)	307.0 (10843)	298.8 (10552)
HC SAMPLE METER/RANGE/PPM	20.0/11/ 20	25.2/11/ 25	42.5/11/ 43	23.0/11/ 23
HC BCKGRD METER/RANGE/PPM	5.3/ 1/ 5	5.4/ 1/ 5	5.4/ 1/ 5	5.2/ 1/ 5
CO SAMPLE METER/RANGE/PPM	24.7/13/ 22	18.5/13/ 16	24.6/13/ 22	28.0/13/ 25
CO BCKGRD METER/RANGE/PPM	.9/13/ 1	.9/13/ 1	.8/13/ 1	.8/13/ 1
CO2 SAMPLE METER/RANGE/PCT	17.7/ 3/ .28	25.0/ 3/ .41	57.1/ 3/ 1.01	17.9/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.4/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	25.0/ 2/ 25	32.7/ 2/ 33	88.0/ 2/ 88	25.3/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.8/ 2/ 1	.8/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	96.69	32.55	13.24	96.06
HC CONCENTRATION PPM	15	20	38	18
CO CONCENTRATION PPM	21	15	21	24
CO2 CONCENTRATION PCT	.24	.37	.97	.24
NOX CONCENTRATION PPM	24.2	31.9	87.3	24.9
HC MASS GRAMS	2.55	3.48	6.65	3.08
CO MASS GRAMS	7.24	5.36	7.36	8.34
CO2 MASS GRAMS	1314.1	2040.5	5463.0	1311.8
NOX MASS GRAMS	13.63	18.21	50.63	13.79
FUEL KG (LB)	.417 (.92)	.644 (1.42)	1.719 (3.79)	.417 (.92)
KW HR (HP HR)	1.40 (1.88)	2.12 (2.84)	6.82 (9.14)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	1.82 (1.36)	1.64 (1.23)	.98 (.73)	2.26 (1.68)
BSCO G/KW HR (G/HP HR)	5.16 (3.85)	2.53 (1.88)	1.08 (.80)	6.10 (4.55)
BSCO2 G/KW HR (G/HP HR)	937.06 (698.77)	962.09 (717.40)	801.15 (597.42)	959.40 (715.42)
BSNOX G/KW HR (G/HP HR)	9.72 (7.25)	8.59 (6.40)	7.42 (5.54)	10.08 (7.52)
BSFC KG/KW HR (LB/HP HR)	.297 (.489)	.304 (.499)	.252 (.414)	.305 (.502)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.71 (15.70)
BSHC G/KW HR (G/HP HR)	1.35 (1.00)
BSCO G/KW HR (G/HP HR)	2.42 (1.80)
BSCO2 G/KW HR (G/HP HR)	865 (645)
BSNOX G/KW HR (G/HP HR)	8.22 (6.13)
BSFC KG/KW HR (LB/HP HR)	.273 (.449)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.906 (32.01)
MULTIPLIER FOR	G/TEST	1.330
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1136 (.0847)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4161 (.1887)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.28 (2870.9)

TABLE B-7A. TEST D7-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.466-B
ENGINE MODEL -0 INTERNATIONAL
ENGINE 7.6 L(466 CID) V-8
CVS NO. 10

TEST NO.D-7-1 RUN
DATE 10/26/79
TIME 04:00
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 11.1 GM/KG(77.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0140

BAG RESULTS	1	2	3	4
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	218.4 (8.6)	218.4 (8.6)	218.4 (8.6)	218.4 (8.6)
BLOWER INLET P MM. H2O(IN. H2O)	180.3 (7.1)	180.3 (7.1)	180.3 (7.1)	180.3 (7.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3324	3368	3427	3336
TIME SECONDS	295.9	299.8	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	179.3 (6332)	181.7 (6416)	184.8 (6528)	179.9 (6355)
HC SAMPLE METER/RANGE/PPM	37.5/11/ 37	34.3/11/ 34	47.6/11/ 48	25.0/11/ 25
HC BCKGRD METER/RANGE/PPM	9.2/ 1/ 9	9.1/ 1/ 9	8.1/ 1/ 8	8.0/ 1/ 8
CO SAMPLE METER/RANGE/PPM	43.9/13/ 41	33.5/13/ 31	31.2/13/ 28	22.2/13/ 20
CO BCKGRD METER/RANGE/PPM	5.4/13/ 5	4.9/13/ 4	3.7/13/ 3	2.5/13/ 2
CO2 SAMPLE METER/RANGE/PCT	25.8/ 3/ .42	33.3/ 3/ .55	77.8/ 3/ 1.42	21.9/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.8/ 3/ .04	3.1/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	33.4/ 2/ 33	40.1/ 2/ 40	38.8/ 3/ 116	28.1/ 2/ 28
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.2/ 2/ 0	.3/ 3/ 1	1.0/ 2/ 1
DILUTION FACTOR	31.22	23.87	9.36	37.38
HC CONCENTRATION PPM	29	26	40	17
CO CONCENTRATION PPM	35	26	24	17
CO2 CONCENTRATION PCT	.38	.51	1.38	.31
NOX CONCENTRATION PPM	33.0	39.9	115.6	27.1
HC MASS GRAMS	2.95	2.68	4.31	1.79
CO MASS GRAMS	7.37	5.42	5.21	3.61
CO2 MASS GRAMS	1257.8	1709.4	4677.3	1014.4
NOX MASS GRAMS	11.48	14.06	41.45	9.47
FUEL KG (LB)	.403 (.89)	.544 (1.20)	1.481 (3.27)	.323 (.71)
KW HR (HP HR)	.95 (1.27)	1.54 (2.07)	5.57 (7.48)	.91 (1.22)
BSHC G/KW HR (G/HP HR)	3.12 (2.33)	1.74 (1.30)	.77 (.58)	1.96 (1.46)
BSCO G/KW HR (G/HP HR)	7.79 (5.81)	3.51 (2.62)	.93 (.70)	3.96 (2.96)
BSCO2 G/KW HR (G/HP HR)	1328.72 (990.83)	1108.16 (826.36)	839.08 (625.70)	1112.88 (829.87)
BSNOX G/KW HR (G/HP HR)	12.13 (9.04)	9.12 (6.80)	7.44 (5.54)	10.39 (7.75)
BSFC KG/KW HR (LB/HP HR)	.426 (.700)	.353 (.580)	.266 (.437)	.355 (.583)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.98 (12.04)
BSHC G/KW HR (G/HP HR)	1.31 (.97)
BSCO G/KW HR (G/HP HR)	2.41 (1.80)
BSCO2 G/KW HR (G/HP HR)	965 (719)
BSNOX G/KW HR (G/HP HR)	8.52 (6.35)
BSFC KG/KW HR (LB/HP HR)	.307 (.504)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.865 (30.57)
MULTIPLIER FOR	G/TEST	.839
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0934 (.0697)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3047 (.1382)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.15 (2866.2)

TABLE B-7A (CONT'D). TEST D7-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.966-B
ENGINE MODEL -8 INTERNATIONAL
ENGINE 7.6 L(966 CID) V-8
CVS NO. 10

TEST NO.D 7-1 RUN
DATE 10/26/79
TIME 04:40
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0024

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	218.4 (8.6)	218.4 (8.6)	218.4 (8.6)	218.4 (8.6)
BLOWER INLET P MM. H2O(IN. H2O)	180.3 (7.1)	180.3 (7.1)	180.3 (7.1)	180.3 (7.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3324	3369	3428	3335
TIME SECONDS	295.9	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	179.3 (6335)	181.8 (6420)	185.0 (6533)	179.9 (6355)
HC SAMPLE METER/RANGE/PPM	21.0/11/ 21	25.8/11/ 26	93.9/11/ 93	22.9/11/ 23
HC BCKGRD METER/RANGE/PPM	5.7/ 1/ 6	6.0/ 1/ 6	5.9/ 1/ 6	4.8/ 1/ 5
CO SAMPLE METER/RANGE/PPM	23.7/13/ 21	24.6/13/ 22	29.1/13/ 26	20.9/13/ 19
CO BCKGRD METER/RANGE/PPM	1.2/13/ 1	1.0/13/ 1	1.0/13/ 1	1.0/13/ 1
CO2 SAMPLE METER/RANGE/PCT	22.2/ 3/ .36	31.3/ 3/ .52	76.2/ 3/ 1.39	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.5/ 3/ .04	2.8/ 3/ .04	2.4/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	28.1/ 2/ 28	37.2/ 2/ 37	37.2/ 3/ 112	27.5/ 2/ 28
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.6/ 2/ 1	.1/ 3/ 0	.6/ 2/ 1
DILUTION FACTOR	36.88	25.59	9.58	37.78
HC CONCENTRATION PPM	15	20	38	18
CO CONCENTRATION PPM	20	21	24	17
CO2 CONCENTRATION PCT	.32	.48	1.35	.31
NOX CONCENTRATION PPM	27.4	36.6	111.3	26.9
HC MASS GRAMS	1.60	2.10	4.07	1.90
CO MASS GRAMS	4.11	4.36	5.24	3.63
CO2 MASS GRAMS	1062.6	1605.1	4582.2	1037.8
NOX MASS GRAMS	9.43	12.76	39.48	9.29
FUEL KG (LB)	.339 (.75)	.510 (1.12)	1.451 (3.20)	.331 (.73)
KW HR (HP HR)	.98 (1.32)	1.56 (2.09)	5.54 (7.43)	.93 (1.25)
BSHC G/KW HR (G/HP HR)	1.63 (1.21)	1.35 (1.01)	.73 (.55)	2.04 (1.52)
BSCO G/KW HR (G/HP HR)	4.19 (3.12)	2.80 (2.08)	.95 (.71)	3.91 (2.91)
BSCO2 G/KW HR (G/HP HR)	1082.50 (807.22)	1028.86 (767.22)	827.22 (616.86)	1117.05 (832.98)
BSNOX G/KW HR (G/HP HR)	9.61 (7.16)	8.18 (6.10)	7.13 (5.32)	10.00 (7.45)
BSFC KG/KW HR (LB/HP HR)	.345 (.567)	.327 (.538)	.262 (.431)	.356 (.585)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.01	(12.08)
BSHC G/KW HR (G/HP HR)	1.07	(.80)
BSCO G/KW HR (G/HP HR)	1.92	(1.44)
BSCO2 G/KW HR (G/HP HR)	920	(686)
BSNOX G/KW HR (G/HP HR)	7.88	(5.87)
BSFC KG/KW HR (LB/HP HR)	.292	(.480)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.903 (31.88)
MULTIPLIER FOR	G/TEST	.804
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0893 (.0666)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3057 (.1387)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.39 (2874.7)

TABLE B-7B. TEST D7-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.466 B
ENGINE MODEL -0 INTERNATIONAL
ENGINE 7.6 L(466 CID) V-8
CVS NO. 10

TEST NO.D 7-2 RUN
DATE 10/29/79
TIME 10:40
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 733.55 MM HG(28.88 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 11.1 GM/KG(77.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0137

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	215.9 (8.5)	215.9 (8.5)	215.9 (8.5)	215.9 (8.5)
BLOWER INLET P MM. H20(IN. H20)	177.8 (7.0)	177.8 (7.0)	177.8 (7.0)	177.8 (7.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3324	3369	3427	3336
TIME SECONDS	295.8	299.8	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	177.4 (6266)	179.8 (6351)	182.9 (6460)	178.0 (6288)
HC SAMPLE METER/RANGE/PPM	34.1/11/ 34	31.4/11/ 31	44.2/11/ 44	24.3/11/ 24
HC BCKGRD METER/RANGE/PPM	6.5/ 1/ 7	6.2/ 1/ 6	6.0/ 1/ 6	6.1/ 1/ 6
CO SAMPLE METER/RANGE/PPM	42.6/13/ 40	31.2/13/ 28	28.7/13/ 26	22.3/13/ 20
CO BCKGRD METER/RANGE/PPM	1.6/13/ 1	4.4/13/ 4	1.7/13/ 1	2.1/13/ 2
CO2 SAMPLE METER/RANGE/PCT	25.6/ 3/ .42	30.5/ 3/ .50	73.5/ 3/ 1.34	20.1/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.6/ 3/ .04	2.3/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	31.1/ 2/ 31	34.2/ 2/ 34	97.9/ 2/ 98	24.0/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	1.0/ 2/ 1	.6/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	31.51	26.25	9.98	40.89
HC CONCENTRATION PPM	28	25	39	18
CO CONCENTRATION PPM	37	24	23	18
CO2 CONCENTRATION PCT	.38	.47	1.30	.28
NOX CONCENTRATION PPM	30.5	33.2	97.4	23.1
HC MASS GRAMS	2.84	2.63	4.09	1.88
CO MASS GRAMS	7.68	5.00	5.00	3.66
CO2 MASS GRAMS	1228.3	1535.6	4368.0	918.0
NOX MASS GRAMS	10.50	11.59	34.53	7.98
FUEL KG (LB)	.394 (.87)	.489 (1.08)	1.384 (3.05)	.293 (.65)
KW HR (HP HR)	.95 (1.27)	1.63 (2.19)	5.77 (7.73)	1.00 (1.34)
BSHC G/KW HR (G/HP HR)	3.00 (2.24)	1.62 (1.20)	.71 (.53)	1.88 (1.40)
BSCO G/KW HR (G/HP HR)	8.11 (6.05)	3.07 (2.29)	.87 (.65)	3.67 (2.73)
BSCO2 G/KW HR (G/HP HR)	1297.62 (967.64)	941.93 (702.40)	757.39 (564.78)	918.79 (685.14)
BSNOX G/KW HR (G/HP HR)	11.09 (8.27)	7.11 (5.30)	5.99 (4.46)	7.99 (5.96)
BSFC KG/KW HR (LB/HP HR)	.416 (.684)	.300 (.493)	.240 (.394)	.293 (.482)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.847 (29.91)
MULTIPLIER FOR	G/TEST	.848
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0908 (.0677)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3313 (.1503)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.34 (2837.5)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		9.34 (12.53)
BSHC	G/KW HR (G/HP HR)	1.23 (.91)
BSCO	G/KW HR (G/HP HR)	2.28 (1.70)
BSCO2	G/KW HR (G/HP HR)	862 (642)
BSNOX	G/KW HR (G/HP HR)	6.91 (5.16)
BSFC	KG/KW HR (LB/HP HR)	.274 (.450)

TABLE B-7B (CONT'D). TEST D7-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.466 B
ENGINE MODEL -0 INTERNATIONAL
ENGINE 7.6 L(466 CID) V-8
CVS NO. 10

TEST NO.D 7-2 RUN
DATE 10/29/79
TIME 11:25
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 733.30 MM HG(28.87 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 11.1 GM/KG(77.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0139

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	218.4 (8.6)	218.4 (8.6)	218.4 (8.6)	218.4 (8.6)
BLOWER INLET P MM. H2O(IN. H2O)	177.8 (7.0)	177.8 (7.0)	177.8 (7.0)	177.8 (7.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3325	3369	3427	3336
TIME SECONDS	295.9	299.8	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	177.3 (6262)	179.6 (6344)	182.7 (6454)	177.9 (6282)
HC SAMPLE METER/RANGE/PPM	21.6/11/ 22	27.3/11/ 27	43.5/11/ 44	23.8/11/ 24
HC BCKGRD METER/RANGE/PPM	5.1/ 1/ 5	5.3/ 1/ 5	5.1/ 1/ 5	4.9/ 1/ 5
CO SAMPLE METER/RANGE/PPM	24.7/13/ 22	26.0/13/ 23	30.0/13/ 27	21.9/13/ 20
CO BCKGRD METER/RANGE/PPM	1.8/13/ 2	1.8/13/ 2	1.5/13/ 1	1.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	22.8/ 3/ .37	30.7/ 3/ .51	75.9/ 3/ 1.38	21.6/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.5/ 3/ .05	3.5/ 3/ .05	3.7/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	27.0/ 2/ 27	34.5/ 2/ 34	97.5/ 2/ 98	25.2/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.7/ 2/ 1	.9/ 2/ 1	1.0/ 2/ 1
DILUTION FACTOR	35.85	26.11	9.63	37.94
HC CONCENTRATION PPM	17	22	39	19
CO CONCENTRATION PPM	20	21	25	18
CO2 CONCENTRATION PCT	.32	.46	1.34	.29
NOX CONCENTRATION PPM	26.3	33.8	96.7	24.2
HC MASS GRAMS	1.70	2.30	4.11	1.95
CO MASS GRAMS	4.15	4.44	5.27	3.67
CO2 MASS GRAMS	1040.2	1501.9	4473.7	956.6
NOX MASS GRAMS	9.05	11.78	34.27	8.36
FUEL KG (LB)	.332 (.73)	.478 (1.05)	1.417 (3.12)	.305 (.67)
KW HR (HP HR)	1.02 (1.36)	1.58 (2.12)	5.59 (7.50)	.95 (1.27)
BSHC G/KW HR (G/HP HR)	1.67 (1.25)	1.46 (1.09)	.73 (.55)	2.06 (1.54)
BSCO G/KW HR (G/HP HR)	4.08 (3.04)	2.81 (2.10)	.94 (.70)	3.88 (2.89)
BSCO2 G/KW HR (G/HP HR)	1023.07 (762.90)	951.99 (709.90)	800.04 (596.59)	1010.57 (753.58)
BSNOX G/KW HR (G/HP HR)	8.90 (6.64)	7.47 (5.57)	6.13 (4.57)	8.83 (6.58)
BSFC KG/KW HR (LB/HP HR)	.326 (.536)	.303 (.498)	.253 (.417)	.323 (.530)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.13 (12.25)
BSHC G/KW HR (G/HP HR)	1.10 (.82)
BSCO G/KW HR (G/HP HR)	1.92 (1.43)
BSCO2 G/KW HR (G/HP HR)	873 (651)
BSNOX G/KW HR (G/HP HR)	6.95 (5.18)
BSFC KG/KW HR (LB/HP HR)	.277 (.456)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.883 (31.17)
MULTIPLIER FOR	G/TEST	.813
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0890 (.0664)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3211 (.1456)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.11 (2829.5)

TABLE B-8A. TEST D9-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 11.0 L(673 CID) I-6
CVS NO. 10

TEST NO.D9-2 RUN
DATE 12/14/79
TIME 10:05
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 751.59 MM HG(29.59 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 54 PCT
ABSOLUTE HUMIDITY 9.8 GM/KG(68.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H2O(IN. H2O)	548.6 (21.6)	548.6 (21.6)	548.6 (21.6)	548.6 (21.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6264	6370	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	302.2 (10674)	306.2 (10816)	311.9 (10999)	303.2 (10710)
HC SAMPLE METER/RANGE/PPM	26.9/11/ 26	25.9/11/ 26	36.6/11/ 37	21.5/11/ 21
HC BCKGRD METER/RANGE/PPM	5.1/ 1/ 5	5.4/ 1/ 5	5.5/ 1/ 6	5.1/ 1/ 5
CO SAMPLE METER/RANGE/PPM	81.1/13/ 81	91.8/13/ 93	38.8/13/ 36	24.1/13/ 22
CO BCKGRD METER/RANGE/PPM	2.2/13/ 2	1.8/13/ 2	1.2/13/ 1	1.1/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.4/ 3/ .35	29.9/ 3/ .49	65.7/ 3/ 1.18	19.3/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.8/ 3/ .06	3.0/ 3/ .05	3.1/ 3/ .05	3.6/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	12.2/13/ 37	14.8/13/ 44	41.0/13/ 123	13.0/13/ 39
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	.8/ 2/ 1	.2/ 3/ 1	1.0/ 2/ 1
DILUTION FACTOR	37.64	26.51	11.32	42.67
HC CONCENTRATION PPM	21	21	32	16
CO CONCENTRATION PPM	77	84	33	20
CO2 CONCENTRATION PCT	.29	.45	1.13	.26
NOX CONCENTRATION PPM	35.5	43.6	122.4	38.0
HC MASS GRAMS	3.73	3.65	5.68	2.84
CO MASS GRAMS	27.20	31.71	12.10	7.11
CO2 MASS GRAMS	1598.0	2521.8	6465.8	1920.9
NOX MASS GRAMS	20.50	25.53	72.91	22.05
FUEL KG (LB)	.521 (1.15)	.819 (1.80)	2.050 (4.52)	.454 (1.00)
KW HR (HP HR)	1.62 (2.17)	2.76 (3.70)	8.76 (11.75)	1.72 (2.31)
BSHC G/KW HR (G/HP HR)	2.31 (1.72)	1.32 (.99)	.65 (.48)	1.67 (1.25)
BSCO G/KW HR (G/HP HR)	16.81 (12.53)	11.48 (8.56)	1.38 (1.03)	4.13 (3.08)
BSCO2 G/KW HR (G/HP HR)	987.42 (736.32)	913.10 (680.90)	738.06 (550.37)	824.23 (614.63)
BSNOX G/KW HR (G/HP HR)	12.67 (9.45)	9.29 (6.89)	8.32 (6.21)	12.79 (9.54)
BSFC KG/KW HR (LB/HP HR)	.322 (.529)	.295 (.485)	.234 (.385)	.264 (.433)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.86 (19.93)
BSHC G/KW HR (G/HP HR)	1.07 (.80)
BSCO G/KW HR (G/HP HR)	5.26 (3.92)
BSCO2 G/KW HR (G/HP HR)	808 (602)
BSNOX G/KW HR (G/HP HR)	9.48 (7.07)
BSFC KG/KW HR (LB/HP HR)	.258 (.425)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.837 (29.57)
MULTIPLIER FOR	G/TEST	1.461
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0983 (.0733)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3805 (.1726)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	85.10 (3005.7)

TABLE B-8A (CONT'D). TEST D9-3 EMISSIONS RESULTS

HOT TRANSIENT 2

PROJECT NO. 11-5044-001

TEST NO.D9-3 RUN 2
DATE 12/17/79
TIME 2127
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 9.5 GM/KG(66.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

BAROMETER 755.65 MM HG(29.75 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H2O(IN. H2O)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6265	6371	6202
TIME SECONDS	296.1	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	309.8 (10765)	308.8 (10908)	314.0 (11092)	305.7 (10798)
HC SAMPLE METER/RANGE/PPM	21.6/11/ 22	25.9/11/ 26	39.0/11/ 39	25.3/11/ 25
HC BCKGRD METER/RANGE/PPM	5.3/ 1/ 5	5.5/ 1/ 6	5.5/ 1/ 6	6.0/ 1/ 6
CO SAMPLE METER/RANGE/PPM	27.0/13/ 24	14.8/13/ 13	38.3/13/ 35	25.7/13/ 23
CO BCKGRD METER/RANGE/PPM	3.0/13/ 3	3.4/13/ 3	4.1/13/ 4	4.3/13/ 4
CO2 SAMPLE METER/RANGE/PCT	19.6/ 3/ .31	27.7/ 3/ .45	63.0/ 3/ 1.12	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.0/ 3/ .05	3.0/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.5/13/ 31	13.9/13/ 40	41.0/13/ 123	10.7/13/ 32
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.6/ 2/ 1	.9/ 2/ 0	.9/ 2/ 0
DILUTION FACTOR	41.96	29.21	11.86	45.27
HC CONCENTRATION PPM	16	21	34	19
CO CONCENTRATION PPM	21	10	31	19
CO2 CONCENTRATION PCT	.26	.41	1.08	.25
NOX CONCENTRATION PPM	31.2	39.6	122.7	31.8
HC MASS GRAMS	2.89	3.66	6.16	3.43
CO MASS GRAMS	7.54	3.56	11.22	6.75
CO2 MASS GRAMS	1465.1	2321.9	6215.8	1379.1
NOX MASS GRAMS	18.17	23.39	73.72	18.57
FUEL KG (LB)	.468 (1.03)	.737 (1.63)	1.971 (4.35)	.442 (.97)
KW HR (HP HR)	1.67 (2.24)	2.73 (3.66)	8.85 (11.87)	1.60 (2.15)
BSHC G/KW HR (G/HP HR)	1.73 (1.29)	1.34 (1.00)	.70 (.52)	2.14 (1.60)
BSCO G/KW HR (G/HP HR)	4.51 (3.36)	1.31 (.97)	1.27 (.95)	4.22 (3.14)
BSCO2 G/KW HR (G/HP HR)	876.68 (653.79)	851.56 (635.01)	702.47 (523.83)	861.99 (642.41)
BSNOX G/KW HR (G/HP HR)	10.88 (8.11)	8.58 (6.40)	8.33 (6.21)	11.60 (8.65)
BSFC KG/KW HR (LB/HP HR)	.280 (.461)	.270 (.445)	.223 (.366)	.276 (.453)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.85 (19.91)
BSHC G/KW HR (G/HP HR)	1.09 (.81)
BSCO G/KW HR (G/HP HR)	1.96 (1.46)
BSCO2 G/KW HR (G/HP HR)	767 (572)
BSNOX G/KW HR (G/HP HR)	9.02 (6.72)
BSFC KG/KW HR (LB/HP HR)	.294 (.401)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.890 (31.45)
MULTIPLIER FOR	G/TEST	1.385
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0933 (.0696)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3828 (.1736)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	85.86 (3032.6)

TABLE B-8B. TEST D9-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D9-3 RUN
DATE 12/17/79
TIME 1107
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

BAROMETER 755.90 MM HG(29.74 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H2O(IN. H2O)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6264	6371	6202
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	309.6 (10757)	308.6 (10899)	313.9 (11086)	305.5 (10792)
HC SAMPLE METER/RANGE/PPM	23.4/11/ 23	25.7/11/ 26	38.6/11/ 39	23.7/11/ 24
HC BCKGRD METER/RANGE/PPM	5.9/ 1/ 6	6.2/ 1/ 6	6.8/ 1/ 7	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	34.6/13/ 32	38.6/13/ 36	48.1/13/ 45	34.4/13/ 31
CO BCKGRD METER/RANGE/PPM	4.8/13/ 4	7.9/13/ 7	14.3/13/ 13	14.5/13/ 13
CO2 SAMPLE METER/RANGE/PCT	20.7/ 3/ .33	29.4/ 3/ .48	66.7/ 3/ 1.20	19.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	3.6/ 3/ .06	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	11.6/13/ 35	13.6/13/ 41	40.2/13/ 121	11.3/13/ 34
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.8/ 2/ 1	.3/ 3/ 1	1.2/ 2/ 1
DILUTION FACTOR	39.53	27.29	11.12	42.97
HC CONCENTRATION PPM	18	20	32	17
CO CONCENTRATION PPM	27	28	32	18
CO2 CONCENTRATION PCT	.29	.44	1.15	.26
NOX CONCENTRATION PPM	34.1	40.0	119.7	32.9
HC MASS GRAMS	3.11	3.51	5.86	2.98
CO MASS GRAMS	9.52	10.09	11.73	6.55
CO2 MASS GRAMS	1610.7	2499.3	6593.0	1929.7
NOX MASS GRAMS	19.84	23.61	71.88	19.21
FUEL KG (LB)	.516 (1.14)	.796 (1.76)	2.090 (4.61)	.457 (1.01)
KW HR (HP HR)	1.51 (2.03)	2.67 (3.59)	8.87 (11.89)	1.62 (2.17)
BSHC G/KW HR (G/HP HR)	2.05 (1.53)	1.31 (.98)	.66 (.49)	1.84 (1.37)
BSCO G/KW HR (G/HP HR)	6.30 (4.69)	3.77 (2.81)	1.32 (.99)	4.05 (3.02)
BSCO2 G/KW HR (G/HP HR)	1064.68 (793.93)	939.69 (697.00)	743.62 (554.51)	883.39 (658.75)
BSNOX G/KW HR (G/HP HR)	13.11 (9.78)	8.83 (6.58)	8.11 (6.05)	11.87 (8.85)
BSFC KG/KW HR (LB/HP HR)	.341 (.560)	.298 (.490)	.236 (.388)	.282 (.464)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		14.67 (19.67)
BSHC	G/KW HR (G/HP HR)	1.05 (.79)
BSCO	G/KW HR (G/HP HR)	2.58 (1.93)
BSCO2	G/KW HR (G/HP HR)	827 (617)
BSNOX	G/KW HR (G/HP HR)	9.17 (6.84)
BSFC	KG/KW HR (LB/HP HR)	.263 (.432)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.872 (30.81)
MULTIPLIER FOR	G/TEST	1.413
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0963 (.0718)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3661 (.1661)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	85.56 (3022.0)

TABLE B-8B (CONT'D). TEST 9-3 EMISSIONS RESULTS

HOT TRANSIENT 1 — PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.09-3 RUN 1
DATE 12/17/79
TIME 1147
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 755.40 MM HG(29.74 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 50 PCT
ABSOLUTE HUMIDITY 9.0 GM/KG(62.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H2O(IN. H2O)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6264	6371	6202
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	304.3 (10748)	308.3 (10890)	313.6 (11076)	305.3 (10783)
HC SAMPLE METER/RANGE/PPM	20.3/11/ 20	24.8/11/ 25	39.1/11/ 39	24.7/11/ 25
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5	5.7/ 1/ 6	5.7/ 1/ 6	5.2/ 1/ 5
CO SAMPLE METER/RANGE/PPM	30.4/13/ 28	32.8/13/ 30	40.9/13/ 38	27.2/13/ 24
CO BCKGRD METER/RANGE/PPM	5.9/13/ 5	8.6/13/ 8	7.8/13/ 7	5.9/13/ 5
CO2 SAMPLE METER/RANGE/PCT	20.4/ 3/ .33	26.8/ 3/ .44	69.4/ 3/ 1.15	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	2.9/ 3/ .04	5.4/ 3/ .08	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.8/13/ 33	13.7/13/ 41	40.7/13/ 122	10.6/13/ 32
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.9/ 2/ 1	.5/ 3/ 2	.9/ 2/ 1
DILUTION FACTOR	40.22	30.15	11.57	37.70
HC CONCENTRATION PPM	15	19	34	20
CO CONCENTRATION PPM	22	22	30	19
CO2 CONCENTRATION PCT	.28	.40	1.07	.30
NOX CONCENTRATION PPM	31.9	40.2	120.7	31.0
HC MASS GRAMS	2.68	3.43	6.13	3.45
CO MASS GRAMS	7.79	7.88	11.09	6.75
CO2 MASS GRAMS	1564.0	2237.0	6173.0	1693.6
NOX MASS GRAMS	18.55	23.69	72.42	18.09
FUEL KG (LB)	.500 (1.10)	.713 (1.57)	1.958 (4.32)	.541 (1.19)
KW HR (HP HR)	1.71 (2.29)	2.74 (3.68)	8.87 (11.89)	1.60 (2.15)
BSHC G/KW HR (G/HP HR)	1.57 (1.17)	1.25 (.93)	.69 (.52)	2.16 (1.61)
BSCO G/KW HR (G/HP HR)	4.56 (3.40)	2.87 (2.14)	1.25 (.93)	4.22 (3.15)
BSCO2 G/KW HR (G/HP HR)	916.57 (683.48)	815.16 (607.87)	696.29 (519.19)	1057.94 (788.91)
BSNOX G/KW HR (G/HP HR)	10.87 (8.11)	8.63 (6.44)	8.17 (6.09)	11.30 (8.43)
BSFC KG/KW HR (LB/HP HR)	.293 (.481)	.260 (.427)	.221 (.363)	.338 (.555)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.92 (20.00)
BSHC G/KW HR (G/HP HR)	1.05 (.78)
BSCO G/KW HR (G/HP HR)	2.24 (1.67)
BSCO2 G/KW HR (G/HP HR)	782 (583)
BSNOX G/KW HR (G/HP HR)	8.90 (6.64)
BSFC KG/KW HR (LB/HP HR)	.249 (.409)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.885 (31.26)
MULTIPLIER FOR	G/TEST	1.391
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0933 (.0696)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3750 (.1701)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	84.52 (2985.4)

TABLE B-9A. TEST D10-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D10-4 RUN
DATE 1/10/80
TIME 10:36
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETA2
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	386.1 (15.2)	386.1 (15.2)	386.1 (15.2)	386.1 (15.2)
BLOWER INLET P MM. H2O(IN. H2O)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6271	6372	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	304.3 (10747)	308.6 (10899)	313.6 (11075)	305.2 (10781)
HC SAMPLE METER/RANGE/PPM	13.4/11/ 13	15.3/11/ 15	29.4/11/ 29	13.1/11/ 13
HC BCKGRD METER/RANGE/PPM	6.3/ 1/ 6	6.2/ 1/ 6	5.8/ 1/ 6	6.2/ 1/ 6
CO SAMPLE METER/RANGE/PPM	22.3/13/ 20	26.6/13/ 24	42.5/13/ 39	17.2/13/ 15
CO BCKGRD METER/RANGE/PPM	2.8/13/ 2	2.4/13/ 2	2.1/13/ 2	2.1/13/ 2
CO2 SAMPLE METER/RANGE/PCT	24.3/ 3/ .40	32.0/ 3/ .53	72.2/ 3/ 1.31	20.8/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.6/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	7.0/13/ 21	10.3/13/ 31	33.0/13/ 99	7.7/13/ 23
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	33.61	25.03	10.18	39.64
HC CONCENTRATION PPM	7	9	24	7
CO CONCENTRATION PPM	17	21	36	13
CO2 CONCENTRATION PCT	.36	.49	1.27	.30
NOX CONCENTRATION PPM	19.9	29.9	98.0	22.1
HC MASS GRAMS	1.28	1.66	9.37	1.24
CO MASS GRAMS	6.05	7.65	13.20	4.66
CO2 MASS GRAMS	1980.2	2787.8	7311.5	1665.9
NOX MASS GRAMS	11.55	17.65	58.79	12.88
FUEL KG (LB)	.629 (1.39)	.884 (1.95)	2.316 (5.11)	.529 (1.17)
KW HR (HP HR)	1.76 (2.36)	2.76 (3.70)	8.67 (11.63)	1.76 (2.36)
BSHC G/KW HR (G/HP HR)	.73 (.54)	.60 (.45)	.50 (.38)	.71 (.53)
BSCO G/KW HR (G/HP HR)	3.44 (2.57)	2.77 (2.07)	1.52 (1.13)	2.65 (1.98)
BSCO2 G/KW HR (G/HP HR)	1125.68 (839.42)	1009.38 (752.70)	843.06 (628.67)	947.01 (706.19)
BSNOX G/KW HR (G/HP HR)	6.57 (4.90)	6.39 (4.77)	6.78 (5.06)	7.32 (5.46)
BSFC KG/KW HR (LB/HP HR)	.357 (.587)	.320 (.526)	.267 (.439)	.301 (.494)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.95	(20.05)
BSHC G/KW HR (G/HP HR)	.57	(.43)
BSCO G/KW HR (G/HP HR)	2.11	(1.57)
BSCO2 G/KW HR (G/HP HR)	919	(685)
BSNOX G/KW HR (G/HP HR)	6.75	(5.03)
BSFC KG/KW HR (LB/HP HR)	.291	(.479)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.838	(29.58)
MULTIPLIER FOR	G/TEST	1.471	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0983	(.0733)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3375	(.1531)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.72	(2886.4)

TABLE B-9A (CONT'D). TEST D10-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D10-4 RUN
DATE 1/10/80
TIME 11:16
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)
BLOWER INLET P MM. H2O(IN. H2O)	375.9 (14.8)	375.9 (14.8)	375.9 (14.8)	375.9 (14.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6266	6372	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	304.7 (10762)	308.8 (10906)	314.0 (11090)	305.7 (10796)
HC SAMPLE METER/RANGE/PPM	11.9/11/ 12	15.3/11/ 15	28.5/11/ 29	12.8/11/ 13
HC BCKGRD METER/RANGE/PPM	5.8/ 1/ 6	6.1/ 1/ 6	7.8/ 1/ 8	9.0/ 1/ 9
CO SAMPLE METER/RANGE/PPM	19.2/13/ 17	25.5/13/ 23	44.1/13/ 41	17.0/13/ 15
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1	1.3/13/ 1	1.2/13/ 1	1.4/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.4/ 3/ .35	30.8/ 3/ .51	71.2/ 3/ 1.29	20.1/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.1/ 3/ .03	2.6/ 3/ .04	2.8/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	7.3/13/ 22	11.5/13/ 34	33.2/13/ 100	7.5/13/ 22
NOX BCKGRD METER/RANGE/PPM	2.3/ 2/ 2	.7/ 2/ 1	.8/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	38.47	26.09	10.34	41.09
HC CONCENTRATION PPM	6	9	21	4
CO CONCENTRATION PPM	16	21	38	14
CO2 CONCENTRATION PCT	.31	.47	1.25	.28
NOX CONCENTRATION PPM	19.7	33.7	99.0	21.7
HC MASS GRAMS	1.09	1.67	3.89	.70
CO MASS GRAMS	5.61	7.62	14.05	4.81
CO2 MASS GRAMS	1753.6	2667.5	7187.8	1584.5
NOX MASS GRAMS	11.45	14.93	59.46	12.70
FUEL KG (LB)	.557 (1.23)	.846 (1.87)	2.277 (5.02)	.503 (1.11)
KW HR (HP HR)	1.83 (2.45)	2.80 (3.75)	8.67 (11.63)	1.74 (2.34)
BSHC G/KW HR (G/HP HR)	.60 (.45)	.60 (.45)	.45 (.33)	.40 (.30)
BSCO G/KW HR (G/HP HR)	3.07 (2.29)	2.73 (2.03)	1.62 (1.21)	2.76 (2.06)
BSCO2 G/KW HR (G/HP HR)	958.51 (714.76)	953.67 (711.15)	828.80 (618.03)	909.84 (678.47)
BSNOX G/KW HR (G/HP HR)	6.26 (4.67)	7.13 (5.31)	6.86 (5.11)	7.29 (5.44)
BSFC KG/KW HR (LB/HP HR)	.304 (.500)	.303 (.497)	.263 (.432)	.289 (.474)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.04 (20.17)
BSHC G/KW HR (G/HP HR)	.49 (.36)
BSCO G/KW HR (G/HP HR)	2.13 (1.59)
BSCO2 G/KW HR (G/HP HR)	877 (654)
BSNOX G/KW HR (G/HP HR)	6.88 (5.13)
BSFC KG/KW HR (LB/HP HR)	.278 (.457)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.896 (31.65)
MULTIPLIER FOR	G/TEST	1.376
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0915 (.0682)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3290 (.1492)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.44 (2911.9)

TABLE B-9B. TEST D10-6 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D10-6 RUN
DATE 1/15/80
TIME 10:23
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 11.5 GM/KG(80.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 8.0 L(490 CID) I-6
CVS NO. 10

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)

BAG RESULTS	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)
BLOWER INLET P MM. H2O(IN. H2O)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6204	6266	6371	6202
TIME SECONDS	297.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	306.5 (10825)	309.5 (10933)	314.7 (11116)	306.4 (10821)
HC SAMPLE METER/RANGE/PPM	12.7/11/ 13	14.8/11/ 15	28.4/11/ 28	12.4/11/ 12
HC BCKGRD METER/RANGE/PPM	4.2/ 1/ 4	4.5/ 1/ 5	4.7/ 1/ 5	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	22.1/13/ 20	26.4/13/ 24	42.6/13/ 40	16.0/13/ 14
CO BCKGRD METER/RANGE/PPM	1.6/13/ 1	2.0/13/ 2	1.2/13/ 1	.8/13/ 1
CO2 SAMPLE METER/RANGE/PCT	24.1/ 3/ .39	31.0/ 3/ .51	71.7/ 3/ 1.30	20.7/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.1/ 3/ .03	2.4/ 3/ .04	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	7.3/13/ 22	10.3/13/ 31	33.6/13/ 101	7.8/13/ 23
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.4/ 2/ 0	.4/ 2/ 0	.5/ 2/ 1
DILUTION FACTOR	33.91	25.90	10.26	39.86
HC CONCENTRATION PPM	9	10	24	6
CO CONCENTRATION PPM	18	21	37	13
CO2 CONCENTRATION PCT	.36	.48	1.27	.30
NOX CONCENTRATION PPM	21.2	30.6	100.3	22.9
HC MASS GRAMS	1.52	1.87	4.38	1.00
CO MASS GRAMS	6.39	7.73	13.54	4.69
CO2 MASS GRAMS	2008.7	2736.3	7295.6	1687.8
NOX MASS GRAMS	12.45	18.10	60.41	13.44
FUEL KG (LB)	.638 (1.41)	.868 (1.91)	2.311 (5.09)	.535 (1.18)
KW HR (HP HR)	1.79 (2.41)	2.76 (3.70)	8.71 (11.68)	1.72 (2.31)
BSHC G/KW HR (G/HP HR)	.85 (.63)	.68 (.50)	.50 (.38)	.58 (.43)
BSCO G/KW HR (G/HP HR)	3.56 (2.65)	2.80 (2.09)	1.55 (1.16)	2.72 (2.03)
BSCO2 G/KW HR (G/HP HR)	1119.46 (834.78)	990.76 (738.81)	837.83 (624.77)	979.01 (730.04)
BSNOX G/KW HR (G/HP HR)	6.94 (5.17)	6.56 (4.89)	6.94 (5.17)	7.80 (5.81)
BSFC KG/KW HR (LB/HP HR)	.356 (.584)	.314 (.517)	.265 (.436)	.311 (.511)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.839 (29.63)
MULTIPLIER FOR	G/TEST	1.475
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0989 (.0734)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3388 (.1537)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.32 (2907.6)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		14.99 (20.10)
BSHC	G/KW HR (G/HP HR)	.59 (.44)
BSCO	G/KW HR (G/HP HR)	2.16 (1.61)
BSCO2	G/KW HR (G/HP HR)	916 (683)
BSNOX	G/KW HR (G/HP HR)	6.97 (5.19)
BSFC	KG/KW HR (LB/HP HR)	.290 (.477)

TABLE B-9B (CONT'D). TEST D10-6 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D10-6 RUN
DATE 1/15/80
TIME 11:06
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)
BLOWER INLET P MM. H2O(IN. H2O)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6265	6371	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	305.3 (10784)	309.4 (10929)	314.7 (11114)	306.4 (10821)
HC SAMPLE METER/RANGE/PPM	12.2/11/ 12	15.6/11/ 16	29.7/11/ 30	13.0/11/ 13
HC BCKGRD METER/RANGE/PPM	7.9/ 1/ 8	6.7/ 1/ 7	6.8/ 1/ 7	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	18.7/13/ 17	25.8/13/ 23	45.5/13/ 42	16.9/13/ 15
CO BCKGRD METER/RANGE/PPM	.9/13/ 0	.5/13/ 0	.9/13/ 0	.5/13/ 0
CO2 SAMPLE METER/RANGE/PCT	21.8/ 3/ .35	30.7/ 3/ .51	71.0/ 3/ 1.28	21.0/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	7.0/13/ 21	10.9/13/ 33	33.5/13/ 100	7.5/13/ 22
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.6/ 2/ 1	.8/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	37.73	26.17	10.37	39.25
HC CONCENTRATION PPM	4	9	29	6
CO CONCENTRATION PPM	16	22	40	14
CO2 CONCENTRATION PCT	.31	.47	1.25	.30
NOX CONCENTRATION PPM	20.3	32.1	99.7	21.7
HC MASS GRAMS	.79	1.63	4.27	1.11
CO MASS GRAMS	5.64	7.98	14.81	5.06
CO2 MASS GRAMS	1753.8	2646.1	7179.4	1682.8
NOX MASS GRAMS	11.85	19.01	60.01	12.73
FUEL KG (LB)	.556 (1.23)	.840 (1.85)	2.275 (5.02)	.534 (1.18)
KW HR (HP HR)	1.78 (2.38)	2.76 (3.70)	8.69 (11.65)	1.72 (2.31)
BSHC G/KW HR (G/HP HR)	.44 (.33)	.59 (.44)	.49 (.37)	.64 (.48)
BSCO G/KW HR (G/HP HR)	3.17 (2.37)	2.89 (2.15)	1.70 (1.27)	2.94 (2.19)
BSCO2 G/KW HR (G/HP HR)	987.10 (736.08)	958.10 (714.46)	826.16 (616.07)	976.13 (727.90)
BSNOX G/KW HR (G/HP HR)	6.67 (4.97)	6.88 (5.13)	6.91 (5.15)	7.38 (5.51)
BSFC KG/KW HR (LB/HP HR)	.313 (.515)	.304 (.500)	.262 (.430)	.310 (.509)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.95 (20.05)
BSHC G/KW HR (G/HP HR)	.52 (.39)
BSCO G/KW HR (G/HP HR)	2.24 (1.67)
BSCO2 G/KW HR (G/HP HR)	887 (661)
BSNOX G/KW HR (G/HP HR)	6.93 (5.17)
BSFC KG/KW HR (LB/HP HR)	.281 (.462)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.835 (29.50)
MULTIPLIER FOR	G/TEST	1.480
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0990 (.0738)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3519 (.1596)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.00 (2896.2)

TABLE B-10A. TEST D11-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C 903
ENGINE MODEL 79 CUMMINS VTB 903
ENGINE 7.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-1 RUN
DATE 2/ 1/80
TIME 01:53
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 751.84 MM HG(29.60 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 99 PCT
ABSOLUTE HUMIDITY 8.3 GM/KG(57.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)
BLOWER INLET P MM. H2O(IN. H2O)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179	6266	6372	6202
TIME SECONDS	295.9	300.2	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	310.6 (10970)	315.0 (11125)	320.3 (11313)	311.8 (11011)
HC SAMPLE METER/RANGE/PPM	52.9/11/ 53	73.2/11/ 73	92.3/11/ 92	90.3/11/ 90
HC BCKGRD METER/RANGE/PPM	9.0/ 1/ 9	9.1/ 1/ 9	9.9/ 1/ 9	9.9/ 1/ 10
CO SAMPLE METER/RANGE/PPM	26.8/13/ 24	24.2/13/ 22	27.7/13/ 25	15.2/13/ 13
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2	.8/13/ 1	.8/13/ 1	.8/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.9/ 3/ .35	27.1/ 3/ .44	59.3/ 3/ 1.05	18.1/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	3.0/ 3/ .05	3.0/ 3/ .05	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	6.2/13/ 19	10.2/13/ 31	33.7/13/ 101	5.6/13/ 17
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	37.05	29.53	12.63	35.44
HC CONCENTRATION PPM	44	64	84	31
CO CONCENTRATION PPM	22	20	23	12
CO2 CONCENTRATION PCT	.32	.40	1.01	.25
NOX CONCENTRATION PPM	17.8	29.6	100.1	16.8
HC MASS GRAMS	7.90	11.70	15.45	5.51
CO MASS GRAMS	7.95	7.51	8.74	4.52
CO2 MASS GRAMS	1802.5	2307.2	5905.5	1405.3
NOX MASS GRAMS	10.55	17.83	61.34	9.42
FUEL KG (LB)	.580 (1.28)	.743 (1.64)	1.881 (4.15)	.451 (.99)
KW HR (HP HR)	1.34 (1.79)	2.23 (3.00)	7.35 (9.86)	1.25 (1.67)
BSHC G/KW HR (G/HP HR)	5.91 (4.41)	5.24 (3.91)	2.10 (1.57)	4.41 (3.29)
BSCO G/KW HR (G/HP HR)	5.95 (4.43)	3.36 (2.51)	1.19 (.89)	3.62 (2.70)
BSCO2 G/KW HR (G/HP HR)	1348.20 (1005.35)	1032.71 (770.09)	803.12 (598.89)	1125.17 (839.09)
BSNOX G/KW HR (G/HP HR)	7.89 (5.89)	7.98 (5.95)	8.34 (6.22)	7.54 (5.62)
BSFC KG/KW HR (LB/HP HR)	.434 (.713)	.332 (.547)	.256 (.421)	.361 (.593)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.957 (33.80)
MULTIPLIER FOR	G/TEST	1.314
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1080 (.0805)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3596 (.1631)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	83.68 (2955.7)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		12.17 (16.32)
BSHC	G/KW HR (G/HP HR)	3.33 (2.48)
BSCO	G/KW HR (G/HP HR)	2.36 (1.76)
BSCO2	G/KW HR (G/HP HR)	938 (700)
BSNOX	G/KW HR (G/HP HR)	8.14 (6.07)
BSFC	KG/KW HR (LB/HP HR)	.300 (.494)

TABLE B-10A (CONT'D). TEST D11-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5049-001

ENGINE NO.C 903
ENGINE MODEL 79 CUMMINS VT8903
ENGINE 4.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-1 RUN
DATE 2/ 1/80
TIME 0214?
DYNO NO. 5

DIESEL EM-321-F
BAG CARB NO. 1

BAROMETER 751.84 MM HG(29.60 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 49 PCT
ABSOLUTE HUMIDITY 8.3 GM/KG(57.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	350.5 (13.8)	350.5 (13.8)	350.5 (13.8)	350.5 (13.8)
BLOWER INLET P MM. H2O(IN. H2O)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6264	6372	6201
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	310.7 (10975)	314.9 (11123)	320.3 (11314)	311.7 (11011)
HC SAMPLE METER/RANGE/PPM	6.7/22/ 33	9.2/22/ 46	8.2/22/ 41	7.2/22/ 36
HC BCKGRD METER/RANGE/PPM	9.0/ 1/ 9	9.9/ 1/ 10	11.0/ 1/ 11	12.0/ 1/ 12
CO SAMPLE METER/RANGE/PPM	16.9/13/ 15	20.1/13/ 18	23.6/13/ 21	16.2/13/ 14
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1	.9/13/ 1	1.0/13/ 1	1.0/13/ 1
CO2 SAMPLE METER/RANGE/PCT	18.1/ 3/ .29	25.6/ 3/ .42	58.9/ 3/ 1.03	17.9/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.1/ 3/ .05	3.1/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	5.5/13/ 17	11.2/13/ 34	38.2/13/ 115	6.3/13/ 19
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.8/ 2/ 1	.3/ 3/ 1	.9/ 2/ 1
DILUTION FACTOR	45.53	31.58	12.92	46.02
HC CONCENTRATION PPM	25	36	31	24
CO CONCENTRATION PPM	14	17	20	13
CO2 CONCENTRATION PCT	.24	.37	.99	.24
NOX CONCENTRATION PPM	15.9	32.9	113.8	17.9
HC MASS GRAMS	4.40	6.58	5.71	4.38
CO MASS GRAMS	4.96	6.12	7.30	4.78
CO2 MASS GRAMS	1374.9	2196.0	5792.8	1377.4
NOX MASS GRAMS	9.42	19.83	69.71	10.66
FUEL KG (LB)	.440 (.97)	.686 (1.51)	1.835 (4.05)	.441 (.97)
KW HR (HP HR)	1.28 (1.72)	2.29 (3.07)	7.34 (9.84)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	3.42 (2.55)	2.88 (2.15)	.78 (.58)	3.46 (2.58)
BSCO G/KW HR (G/HP HR)	3.86 (2.88)	2.68 (2.00)	.99 (.74)	3.78 (2.82)
BSCO2 G/KW HR (G/HP HR)	1070.68 (798.41)	938.38 (699.75)	789.68 (588.87)	1087.50 (810.95)
BSNOX G/KW HR (G/HP HR)	7.34 (5.47)	8.67 (6.47)	9.50 (7.09)	8.42 (6.28)
BSFC KG/KW HR (LB/HP HR)	.343 (.564)	.300 (.493)	.250 (.411)	.348 (.572)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.013 (35.78)	
MULTIPLIER FOR	G/TEST	1.241	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1020 (.0760)	
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3648 (.1655)	

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	83.94 (2964.6)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.17 (16.32)	
BSHC G/KW HR (G/HP HR)	1.73 (1.29)	
BSCO G/KW HR (G/HP HR)	1.90 (1.42)	
BSCO2 G/KW HR (G/HP HR)	878 (655)	
BSNOX G/KW HR (G/HP HR)	9.01 (6.72)	
BSFC KG/KW HR (LB/HP HR)	.280 (.460)	

TABLE B-10B. TEST D11-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D11-2 RUN
DATE 2/ 4/80
TIME 12:58
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

RELATIVE HUMIDITY 43 PCT
ABSOLUTE HUMIDITY 8.6 GM/KG(60.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

	1 NYNF	2 LANF	3 LAF	4 NYNF
ENGINE NO.				
ENGINE MODEL	79 CUMMINS VT8903			
ENGINE 8.8 L(903 CID) V-8				
CVS NO.	10			
BAROMETER	745.24 MM HG(29.34 IN HG)			
DRY BULB TEMP.	25.0 DEG C(77.0 DEG F)			
BAG RESULTS				
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET P MM. H20(IN. H20)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6266	6372	6202
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	301.1 (10636)	305.2 (10779)	310.3 (10961)	302.1 (10669)
HC SAMPLE METER/RANGE/PPM	10.5/22/ 52	13.8/22/ 69	17.6/22/ 88	8.1/22/ 40
HC BCKGRD METER/RANGE/PPM	9.9/ 1/ 10	13.0/ 1/ 13	12.1/ 1/ 12	12.2/ 1/ 12
CO SAMPLE METER/RANGE/PPM	28.7/13/ 26	26.4/13/ 24	30.9/13/ 28	17.7/13/ 16
CO BCKGRD METER/RANGE/PPM	2.5/13/ 2	2.4/13/ 2	2.3/13/ 2	2.3/13/ 2
CO2 SAMPLE METER/RANGE/PCT	22.2/ 3/ .36	27.7/ 3/ .45	60.4/ 3/ 1.07	19.4/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	4.4/ 3/ .07	3.9/ 3/ .06	4.0/ 3/ .06	4.0/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	5.8/13/ 18	9.7/13/ 29	34.7/13/ 109	5.6/13/ 17
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.7/ 2/ 1	.7/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	36.52	28.87	12.38	42.27
HC CONCENTRATION PPM	43	56	77	29
CO CONCENTRATION PPM	23	21	25	13
CO2 CONCENTRATION PCT	.29	.40	1.01	.25
NOX CONCENTRATION PPM	16.8	28.6	103.6	16.0
HC MASS GRAMS	7.41	9.92	13.77	9.98
CO MASS GRAMS	8.16	7.53	9.12	9.73
CO2 MASS GRAMS	1618.2	2219.5	5765.6	1391.9
NOX MASS GRAMS	9.70	16.67	61.50	9.22
FUEL KG (LB)	.522 (1.15)	.713 (1.57)	1.836 (4.05)	.446 (.98)
KW HR (HP HR)	1.37 (1.84)	2.25 (3.02)	7.39 (9.91)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	5.40 (4.03)	4.40 (3.28)	1.86 (1.39)	3.93 (2.93)
BSCO G/KW HR (G/HP HR)	5.95 (4.44)	3.35 (2.50)	1.23 (.92)	3.73 (2.78)
BSCO2 G/KW HR (G/HP HR)	1179.34 (879.44)	985.68 (735.02)	780.36 (581.92)	1098.51 (819.16)
BSNOX G/KW HR (G/HP HR)	7.07 (5.27)	7.40 (5.52)	8.32 (6.21)	7.28 (5.43)
BSFC KG/KW HR (LB/HP HR)	.380 (.625)	.317 (.521)	.248 (.408)	.352 (.579)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.28 (16.47)
BSHC G/KW HR (G/HP HR)	2.99 (2.19)
BSCO G/KW HR (G/HP HR)	2.41 (1.79)
BSCO2 G/KW HR (G/HP HR)	895 (668)
BSNOX G/KW HR (G/HP HR)	7.91 (5.90)
BSFC KG/KW HR (LB/HP HR)	.286 (.471)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.959 (33.68)
MULTIPLIER FOR	G/TEST	1.228
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1041 (.0776)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3634 (.1648)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	83.99 (2968.9)

TABLE B-10B (CONT'D). TEST D11-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 5.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-2 RUN
DATE 2/ 9/80
TIME 0119S
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 43 PCT
ABSOLUTE HUMIDITY 8.6 GM/KG(60.5 GRAINS/LB) NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	98.9 (120.0)	98.9 (120.0)	98.9 (120.0)	98.9 (120.0)
BLOWER REVOLUTIONS	6182	6265	6372	6201
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	301.3 (10643)	305.9 (10786)	310.6 (10970)	302.3 (10676)
HC SAMPLE METER/RANGE/PPM	7.0/22/ 35	9.1/22/ 46	8.2/22/ 41	7.2/22/ 36
HC BCKGRD METER/RANGE/PPM	12.1/ 1/ 12	12.2/ 1/ 12	12.7/ 1/ 13	12.7/ 1/ 13
CO SAMPLE METER/RANGE/PPM	17.0/13/ 15	19.3/13/ 17	22.4/13/ 20	15.5/13/ 14
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1	.9/13/ 1	1.0/13/ 1	1.1/13/ 1
CO2 SAMPLE METER/RANGE/PCT	18.9/ 3/ .30	26.5/ 3/ .43	59.5/ 3/ 1.05	17.7/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.2/ 3/ .05	3.7/ 3/ .06	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	5.5/13/ 17	11.3/13/ 34	39.1/13/ 117	6.1/13/ 18
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 0	.9/ 2/ 0	.3/ 3/ 1	.9/ 2/ 0
DILUTION FACTOR	43.51	30.45	12.65	46.57
HC CONCENTRATION PPM	23	39	29	23
CO CONCENTRATION PPM	19	16	19	12
CO2 CONCENTRATION PCT	.25	.39	1.00	.24
NOX CONCENTRATION PPM	16.2	33.5	116.6	17.9
HC MASS GRAMS	3.99	5.95	5.22	4.09
CO MASS GRAMS	4.85	5.69	6.70	4.90
CO2 MASS GRAMS	1399.6	2161.0	5692.3	1316.8
NOX MASS GRAMS	4.37	14.54	69.27	10.37
FUEL KG (LB)	.998 (.99)	.690 (1.52)	1.803 (3.97)	.921 (.93)
KW HR (HP HR)	1.32 (1.77)	2.29 (3.07)	7.42 (9.96)	1.28 (1.72)
BSHC G/KW HR (G/HP HR)	3.02 (2.24)	2.60 (1.94)	.70 (.52)	3.19 (2.38)
BSCO G/KW HR (G/HP HR)	3.68 (2.74)	2.49 (1.86)	.90 (.67)	3.42 (2.55)
BSCO2 G/KW HR (G/HP HR)	1060.83 (791.06)	949.99 (709.64)	766.78 (571.79)	1025.42 (764.66)
BSNOX G/KW HR (G/HP HR)	7.10 (5.29)	8.55 (6.37)	9.33 (6.96)	8.08 (6.02)
BSFC KG/KW HR (LB/HP HR)	.339 (.558)	.302 (.496)	.293 (.399)	.328 (.539)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.31 (	16.51)
BSHC G/KW HR (G/HP HR)	1.56 (	1.17)
BSCO G/KW HR (G/HP HR)	1.76 (	1.31)
BSCO2 G/KW HR (G/HP HR)	858 (	640)
BSNOX G/KW HR (G/HP HR)	8.82 (	6.57)
BSFC KG/KW HR (LB/HP HR)	.273 (	.449)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.973 (34.38)
MULTIPLIER FOR	G/TEST	1.243
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1018 (.0759)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3727 (.1691)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	84.44 (2982.5)

TABLE B-10C. TEST D11-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 8.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-3 RUN
DATE 2/ 5/80
TIME 0112S
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 46 PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180	6265	6371	6201
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	301.1 (10636)	305.3 (10782)	310.9 (10984)	302.1 (10672)
HC SAMPLE METER/RANGE/PPM	10.1/22/ 50	12.7/22/ 63	15.9/22/ 80	7.6/22/ 38
HC BCKGRD METER/RANGE/PPM	6.7/ 1/ 7	8.0/ 1/ 8	8.7/ 1/ 9	9.8/ 1/ 10
CO SAMPLE METER/RANGE/PPM	26.9/13/ 29	20.6/13/ 22	28.2/13/ 25	16.7/13/ 15
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1	.9/13/ 1	.7/13/ 1	.7/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.1/ 3/ .39	26.8/ 3/ .49	58.9/ 3/ 1.09	17.9/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.4/ 3/ .04	2.3/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.3/13/ 13	8.0/13/ 29	28.2/13/ 85	9.3/13/ 13
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.9/ 2/ 1	.6/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	38.59	29.99	12.79	47.34
HC CONCENTRATION PPM	44	56	72	28
CO CONCENTRATION PPM	22	21	24	14
CO2 CONCENTRATION PCT	.30	.40	1.01	.24
NOX CONCENTRATION PPM	12.3	23.0	84.1	12.1
HC MASS GRAMS	2.61	3.79	12.81	4.96
CO MASS GRAMS	2.85	2.39	8.67	4.88
CO2 MASS GRAMS	1471.8	2256.9	5739.8	1330.2
NOX MASS GRAMS	2.06	13.45	49.97	2.00
FUEL KG (LB)	.539 (1.19)	.725 (1.60)	1.825 (4.02)	.427 (.94)
KW HR (HP HR)	1.34 (1.79)	2.25 (3.02)	7.30 (9.79)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	5.69 (4.25)	4.35 (3.24)	1.75 (1.31)	3.92 (2.92)
BSCO G/KW HR (G/HP HR)	5.87 (4.38)	3.28 (2.45)	1.19 (.89)	3.86 (2.88)
BSCO2 G/KW HR (G/HP HR)	1250.45 (932.96)	1002.10 (747.27)	785.54 (585.78)	1050.22 (783.15)
BSNOX G/KW HR (G/HP HR)	5.28 (3.94)	5.97 (4.45)	6.84 (5.10)	5.53 (4.12)
BSFC KG/KW HR (LB/HP HR)	.403 (.662)	.322 (.529)	.250 (.411)	.337 (.554)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.16 (16.30)
BSHC G/KW HR (G/HP HR)	2.89 (2.16)
BSCO G/KW HR (G/HP HR)	2.32 (1.73)
BSCO2 G/KW HR (G/HP HR)	904 (674)
BSNOX G/KW HR (G/HP HR)	6.32 (4.75)
BSFC KG/KW HR (LB/HP HR)	.289 (.475)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.888 (31.35)
MULTIPLIER FOR	G/TEST	1.373
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1130 (.0842)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3907 (.1772)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.43 (2911.3)

TABLE B-10C (CONT'D). TEST D11-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D11-3 RUN
DATE 2/ 5/80
TIME 02113
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

RELATIVE HUMIDITY 49 PCT
ABSOLUTE HUMIDITY 9.5 GM/KG(66.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTR903
ENGINE 8.8 L(903 CID) V-8
CVS NO. 10

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6265	6371	6202
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	300.7 (10622)	309.8 (10765)	309.9 (10997)	301.7 (10657)
HC SAMPLE METER/RANGE/PPM	6.9/22/ 32	8.0/22/ 40	8.0/22/ 40	6.9/22/ 32
HC BCKGRD METER/RANGE/PPM	7.7/ 1/ 8	7.3/ 1/ 7	7.9/ 1/ 8	7.9/ 1/ 8
CO SAMPLE METER/RANGE/PPM	17.8/13/ 16	21.0/13/ 19	24.6/13/ 22	15.9/13/ 14
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1	.9/13/ 1	1.1/13/ 1	1.9/13/ 1
CO2 SAMPLE METER/RANGE/PCT	17.9/ 3/ .28	25.5/ 3/ .42	58.3/ 3/ 1.03	16.5/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.2/ 3/ .03	2.3/ 3/ .04	2.3/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.0/13/ 12	8.9/13/ 27	30.9/13/ 91	9.9/13/ 13
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.8/ 2/ 1	1.0/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	47.43	31.74	12.94	50.13
HC CONCENTRATION PPM	24	33	33	24
CO CONCENTRATION PPM	15	18	20	13
CO2 CONCENTRATION PCT	.24	.38	1.00	.23
NOX CONCENTRATION PPM	11.3	25.9	90.2	12.9
HC MASS GRAMS	4.22	5.80	5.83	4.22
CO MASS GRAMS	5.08	6.21	7.36	4.42
CO2 MASS GRAMS	1390.6	2142.2	5658.2	1261.6
NOX MASS GRAMS	6.52	15.08	53.45	7.13
FUEL KG (LB)	.429 (.95)	.684 (1.51)	1.793 (3.95)	.409 (.89)
KW HR (HP HR)	1.32 (1.77)	2.27 (3.04)	7.30 (9.79)	1.25 (1.67)
BSHC G/KW HR (G/HP HR)	3.20 (2.39)	2.56 (1.91)	.80 (.60)	3.38 (2.52)
BSCO G/KW HR (G/HP HR)	3.85 (2.87)	2.74 (2.04)	1.01 (.75)	3.54 (2.64)
BSCO2 G/KW HR (G/HP HR)	1016.11 (757.71)	943.97 (703.92)	775.05 (577.95)	1010.12 (753.25)
BSNOX G/KW HR (G/HP HR)	4.94 (3.68)	6.65 (4.96)	7.32 (5.46)	5.71 (4.26)
BSFC KG/KW HR (LB/HP HR)	.325 (.535)	.301 (.496)	.246 (.409)	.324 (.532)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.14 (16.28)	
BSHC G/KW HR (G/HP HR)	1.65 (1.23)	
BSCO G/KW HR (G/HP HR)	1.90 (1.42)	
BSCO2 G/KW HR (G/HP HR)	857 (639)	
BSNOX G/KW HR (G/HP HR)	6.77 (5.05)	
BSFC KG/KW HR (LB/HP HR)	.273 (.448)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.922 (34.34)
MULTIPLIER FOR	G/TEST	1.252
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1031 (.0769)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3281 (.1715)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.18 (2867.4)

TABLE B-10D. TEST D11-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 14.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-4 RUN
DATE 2/ 6/80
TIME 10:30
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 748.28 MM HG(29.46 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 47 PCT
ABSOLUTE HUMIDITY 9.1 GM/KG(63.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET P MM. H20(IN. H20)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6266	6373	6202
TIME SECONDS	295.9	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	302.0 (10667)	306.1 (10812)	311.3 (10997)	303.0 (10702)
HC SAMPLE METER/RANGE/PPM	11.2/22/ 56	9.7/22/ 49	10.8/22/ 54	8.2/22/ 41
HC BCKGRD METER/RANGE/PPM	7.0/ 1/ 7	6.7/ 1/ 7	7.3/ 1/ 7	7.7/ 1/ 8
CO SAMPLE METER/RANGE/PPM	24.0/13/ 21	21.3/13/ 19	23.9/13/ 21	19.5/13/ 17
CO BCKGRD METER/RANGE/PPM	1.9/13/ 1	1.9/13/ 1	1.8/13/ 2	1.9/13/ 2
CO2 SAMPLE METER/RANGE/PCT	21.1/ 3/ .34	27.1/ 3/ .44	57.9/ 3/ 1.01	17.8/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.6/ 3/ .04	2.7/ 3/ .04	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	5.2/13/ 16	7.7/13/ 23	26.5/13/ 80	4.2/13/ 13
NOX BCKGRD METER/RANGE/PPM	1.9/ 2/ 2	2.0/ 2/ 2	1.9/ 2/ 2	1.9/ 2/ 2
DILUTION FACTOR	38.50	29.71	13.15	46.16
HC CONCENTRATION PPM	49	42	47	34
CO CONCENTRATION PPM	20	17	19	15
CO2 CONCENTRATION PCT	.30	.41	.97	.25
NOX CONCENTRATION PPM	13.8	21.3	77.8	10.8
HC MASS GRAMS	8.60	7.46	8.45	5.89
CO MASS GRAMS	6.98	6.19	6.81	5.42
CO2 MASS GRAMS	1660.2	2275.7	5549.8	1362.9
NOX MASS GRAMS	7.96	12.49	46.36	6.26
FUEL KG (LB)	.535 (1.18)	.728 (1.60)	1.761 (3.88)	.438 (.97)
KW HR (HP HR)	1.25 (1.67)	2.22 (2.97)	7.19 (9.65)	1.28 (1.72)
BSHC G/KW HR (G/HP HR)	6.89 (5.14)	3.37 (2.51)	1.18 (.88)	4.58 (3.42)
BSCO G/KW HR (G/HP HR)	5.59 (4.17)	2.79 (2.08)	.95 (.71)	4.22 (3.15)
BSCO2 G/KW HR (G/HP HR)	1329.20 (991.19)	1026.70 (765.61)	771.35 (575.20)	1061.32 (791.42)
BSNOX G/KW HR (G/HP HR)	6.37 (4.75)	5.61 (4.19)	6.49 (4.81)	4.87 (3.63)
BSFC KG/KW HR (LB/HP HR)	.429 (.705)	.328 (.540)	.245 (.402)	.341 (.561)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.99 (16.02)
BSHC G/KW HR (G/HP HR)	2.55 (1.90)
BSCO G/KW HR (G/HP HR)	2.13 (1.59)
BSCO2 G/KW HR (G/HP HR)	908 (677)
BSNOX G/KW HR (G/HP HR)	6.11 (4.56)
BSFC KG/KW HR (LB/HP HR)	.290 (.477)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.941 (33.22)
MULTIPLIER FOR	G/TEST	1.300
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1088 (.0811)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3753 (.1702)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.73 (2922.0)

TABLE B-10D (CONT'D). TEST D11-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE *.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-4 RUN
DATE 2/ 6/80
TIME 11:09
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 748.28 MM HG(29.46 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 47 PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(65.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET P MM. H2O(IN. H2O)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6265	6372	6202
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	302.0 (10668)	306.0 (10809)	311.3 (10994)	303.0 (10701)
HC SAMPLE METER/RANGE/PPM	8.6/22/ 43	9.7/22/ 48	6.4/22/ 32	8.0/22/ 40
HC BCKGRD METER/RANGE/PPM	6.5/ 1/ 7	6.8/ 1/ 7	7.0/ 1/ 7	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	21.6/13/ 19	22.9/13/ 20	22.1/13/ 20	20.7/13/ 18
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2	1.5/13/ 1	1.5/13/ 1	1.2/13/ 1
CO2 SAMPLE METER/RANGE/PCT	18.6/ 3/ .30	25.5/ 3/ .42	57.4/ 3/ 1.01	18.4/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	4.2/13/ 13	8.6/13/ 26	29.1/13/ 87	4.4/13/ 13
NOX BCKGRD METER/RANGE/PPM	1.9/ 2/ 2	2.0/ 2/ 2	2.1/ 2/ 2	2.0/ 2/ 2
DILUTION FACTOR	44.06	31.67	13.18	44.61
HC CONCENTRATION PPM	37	42	26	33
CO CONCENTRATION PPM	17	19	18	17
CO2 CONCENTRATION PCT	.26	.38	.98	.25
NOX CONCENTRATION PPM	10.8	23.8	85.5	11.3
HC MASS GRAMS	6.39	7.40	4.60	5.77
CO MASS GRAMS	6.07	6.68	6.47	6.01
CO2 MASS GRAMS	1441.6	2117.6	5564.6	1402.2
NOX MASS GRAMS	6.26	13.96	50.88	6.54
FUEL KG (LB)	.464 (1.02)	.678 (1.50)	1.762 (3.88)	.451 (.99)
KW HR (HP HR)	1.34 (1.79)	2.22 (2.97)	7.16 (9.60)	1.30 (1.75)
BSHC G/KW HR (G/HP HR)	4.78 (3.57)	3.34 (2.49)	.64 (.48)	4.43 (3.30)
BSCO G/KW HR (G/HP HR)	4.54 (3.39)	3.01 (2.25)	.90 (.67)	4.62 (3.44)
BSCO2 G/KW HR (G/HP HR)	1078.26 (804.06)	955.37 (712.42)	777.21 (579.57)	1077.15 (803.23)
BSNOX G/KW HR (G/HP HR)	4.68 (3.49)	6.30 (4.70)	7.11 (5.30)	5.02 (3.75)
BSFC KG/KW HR (LB/HP HR)	.397 (.570)	.306 (.503)	.246 (.405)	.346 (.569)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.01 (16.11)	
BSHC G/KW HR (G/HP HR)	2.01 (1.50)	
BSCO G/KW HR (G/HP HR)	2.10 (1.57)	
BSCO2 G/KW HR (G/HP HR)	876 (653)	
BSNOX G/KW HR (G/HP HR)	6.46 (4.82)	
BSFC KG/KW HR (LB/HP HR)	.279 (.459)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.927 (32.73)
MULTIPLIER FOR	G/TEST	1.319
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1098 (.0819)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3932 (.1784)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.62 (2918.2)

TABLE B-10E. TEST D11-5 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 5.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-5 RUN
DATE 2/ 7/80
TIME 09:30
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 44 PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)
BLOWER INLET P MM. H20(IN. H20)	492.8 (19.4)	492.8 (19.4)	492.8 (19.4)	492.8 (19.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6266	6372	6202
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.9 (10574)	303.5 (10720)	308.6 (10901)	300.9 (10610)
HC SAMPLE METER/RANGE/PPM	10.7/22/ 53	9.6/22/ 48	9.6/22/ 48	10.0/22/ 50
HC BCKGRD METER/RANGE/PPM	5.7/ 1/ 6	5.8/ 1/ 6	6.1/ 1/ 6	7.5/ 1/ 8
CO SAMPLE METER/RANGE/PPM	25.0/13/ 22	22.1/13/ 20	24.7/13/ 22	24.6/13/ 22
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1	.9/13/ 0	.9/13/ 1	1.0/13/ 1
CO2 SAMPLE METER/RANGE/PCT	20.6/ 3/ .33	27.0/ 3/ .44	58.2/ 3/ 1.03	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	3.7/13/ 11	7.1/13/ 21	25.9/13/ 78	4.0/13/ 12
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	.8/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	39.49	29.82	12.96	44.91
HC CONCENTRATION PPM	48	42	43	43
CO CONCENTRATION PPM	21	19	21	21
CO2 CONCENTRATION PCT	.29	.40	.99	.25
NOX CONCENTRATION PPM	11.0	20.9	77.0	11.2
HC MASS GRAMS	8.24	7.42	7.57	7.38
CO MASS GRAMS	7.33	6.69	7.43	7.26
CO2 MASS GRAMS	1590.6	2246.9	5607.1	1371.8
NOX MASS GRAMS	6.32	12.12	45.47	6.46
FUEL KG (LB)	.513 (1.13)	.719 (1.58)	1.779 (3.92)	.443 (.98)
KW HR (HP HR)	1.20 (1.60)	2.08 (2.78)	7.04 (9.44)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	6.89 (5.14)	3.58 (2.67)	1.08 (.80)	5.83 (4.35)
BSCO G/KW HR (G/HP HR)	6.13 (4.57)	3.22 (2.40)	1.06 (.79)	5.73 (4.28)
BSCO2 G/KW HR (G/HP HR)	1329.66 (991.53)	1082.20 (807.00)	796.85 (594.21)	1083.05 (807.63)
BSNOX G/KW HR (G/HP HR)	5.29 (3.94)	5.84 (4.35)	6.46 (4.82)	5.10 (3.80)
BSFC KG/KW HR (LB/HP HR)	.429 (.705)	.346 (.569)	.253 (.416)	.350 (.576)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.58 (15.52)
BSHC G/KW HR (G/HP HR)	2.64 (1.97)
BSCO G/KW HR (G/HP HR)	2.48 (1.85)
BSCO2 G/KW HR (G/HP HR)	934 (697)
BSNOX G/KW HR (G/HP HR)	6.08 (4.53)
BSFC KG/KW HR (LB/HP HR)	.298 (.491)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.933 (32.97)
MULTIPLIER FOR	G/TEST	1.298
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1122 (.0836)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3759 (.1705)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.01 (2896.4)

TABLE B-10E (CONT'D). TEST D11-5 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE *.8 L(903 CID) V-8
CVS NO. 10

TEST NO.D11-5 RUN
DATE 2/ 7/80
TIME 10:10
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 48 PCT
ABSOLUTE HUMIDITY 9.7 GM/KG(68.0 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6265	6372	6202
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.3 (10570)	303.2 (10710)	308.4 (10893)	300.2 (10602)
HC SAMPLE METER/RANGE/PPM	10.1/22/ 50	11.0/22/ 55	7.0/22/ 35	9.4/22/ 47
HC BCKGRD METER/RANGE/PPM	6.3/ 1/ 6	6.1/ 1/ 6	6.2/ 1/ 6	6.2/ 1/ 6
CO SAMPLE METER/RANGE/PPM	23.4/13/ 21	24.6/13/ 22	22.8/13/ 20	22.8/13/ 20
CO BCKGRD METER/RANGE/PPM	.8/13/ 1	1.2/13/ 1	.9/13/ 1	1.1/13/ 1
CO2 SAMPLE METER/RANGE/PCT	17.9/ 3/ .29	25.0/ 3/ .41	56.5/ 3/ .99	16.8/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.7/ 3/ .04	2.4/ 3/ .04	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	3.5/13/ 10	7.7/13/ 23	27.6/13/ 83	4.1/13/ 12
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.1/ 2/ 0	.7/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	45.69	32.27	13.41	48.83
HC CONCENTRATION PPM	44	49	29	41
CO CONCENTRATION PPM	20	21	19	19
CO2 CONCENTRATION PCT	.25	.37	.96	.23
NOX CONCENTRATION PPM	10.2	23.1	82.2	11.5
HC MASS GRAMS	7.63	8.62	5.19	7.09
CO MASS GRAMS	6.90	7.25	6.80	6.65
CO2 MASS GRAMS	1371.8	2041.3	5420.9	1291.1
FUEL KG (LB)	5.82	13.39	48.50	6.62
KW HR (HP HR)	.444 (.98)	.656 (1.45)	1.717 (3.79)	.417 (.92)
	1.30 (1.75)	2.13 (2.85)	7.09 (9.44)	1.28 (1.72)
BSHC G/KW HR (G/HP HR)	5.86 (4.37)	4.05 (3.02)	.74 (.55)	5.52 (4.12)
BSCO G/KW HR (G/HP HR)	5.30 (3.95)	3.41 (2.54)	.97 (.72)	5.18 (3.86)
BSCO2 G/KW HR (G/HP HR)	1053.82 (785.84)	959.01 (715.13)	770.40 (574.49)	1005.37 (749.70)
BSNOX G/KW HR (G/HP HR)	4.47 (3.33)	6.29 (4.69)	6.89 (5.14)	5.16 (3.85)
BSFC KG/KW HR (LB/HP HR)	.391 (.560)	.308 (.506)	.299 (.401)	.325 (.534)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.75 (15.76)	
BSHC G/KW HR (G/HP HR)	2.93 (1.81)	
BSCO G/KW HR (G/HP HR)	2.35 (1.75)	
BSCO2 G/KW HR (G/HP HR)	862 (643)	
BSNOX G/KW HR (G/HP HR)	6.33 (4.72)	
BSFC KG/KW HR (LB/HP HR)	.275 (.452)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.934 (32.99)
MULTIPLIER FOR	G/TEST	1.297
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1103 (.0823)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.9009 (.1818)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.86 (2926.6)

TABLE B-11A. TEST D12-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

TEST NO. D12-3 RUN
DATE 3/17/80
TIME 01:39
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

RELATIVE HUMIDITY 48. PCT
ABSOLUTE HUMIDITY 8.6 GM/KG(60.5 GRAINS/LB) NOX HUMIDITY C.F. 1.0000

	1 NYNF	2 LANF	3 LAF	4 NYNF
	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)
	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)
	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
	6173.	6205.	6369.	6190.
	295.9	300.1	305.0	296.9
	292.5 (10332.)	294.1 (10386.)	301.8 (10660.)	293.3 (10360.)
	10.1/227/ 50.	5.6/227/ 28.	5.7/227/ 28.	3.8/227/ 19.
	6.2/ 1/ 6.	8.1/ 1/ 8.	8.9/ 1/ 9.	9.2/ 1/ 9.
	57.4/127/ 125.	58.7/133/ 56.	56.6/133/ 54.	47.6/133/ 45.
	.4/127/ 1.	.8/133/ 1.	1.0/133/ 1.	.5/133/ 0.
	29.5/ 3/ .49	36.9/ 3/ .62	78.2/ 3/ 1.43	24.9/ 3/ .41
	2.0/ 3/ .03	2.1/ 3/ .03	2.1/ 3/ .03	2.2/ 3/ .03
	5.9/143/ 59.	7.0/143/ 70.	18.6/143/ 186.	6.4/143/ 64.
	.3/ 2/ 0.	.6/ 2/ 1.	.8/ 3/ 2.	.9/ 2/ 14
	26.59	21.31	9.30	32.51
	44.	20.	20.	10.
	121.	54.	51.	43.
	.46	.59	1.40	.37
	58.6	69.0	183.9	62.7
	7.49	3.45	3.55	1.73
	41.19	18.55	17.93	14.75
	2450.2	3177.0	7759.0	2005.3
	32.79	38.82	106.16	35.16
	.792 (1.75)	1.004 (2.21)	2.433 (5.36)	.635 (1.40)
	2.16 (2.90)	3.36 (4.51)	10.41 (13.97)	2.20 (2.95)
	3.46 (2.58)	1.03 (.77)	.34 (.25)	.79 (.59)
	19.04 (14.20)	5.52 (4.12)	1.72 (1.28)	6.71 (5.00)
	1132.41 (844.43)	945.54 (705.09)	745.05 (555.58)	911.95 (680.04)
	15.15 (11.30)	11.55 (8.62)	10.19 (7.60)	15.99 (11.92)
	.366 (.602)	.299 (.491)	.234 (.384)	.289 (.474)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCF(SCF)	.932 (32.90)	
MULTIPLIER FOR	G/TEST	1.268	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0699 (.0522)	
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2608 (.1183)	

20 X 20 FILTERS

SAMPLE FLOW	SCF(SCF)	80.58 (2846.3)	

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TABLE B-11A (CONT'D). TEST D12-3 EMISSIONS RESULTS

HDT TRANSIENT — PROJECT NO. 11-5044-001

TEST NO.D12-3 RUN
DATE 3/17/80
TIME 02:20 — DIESEL EM-408-F
DYNO NO. 5 — BAG CART NO. 1

RELATIVE HUMIDITY 44. PCT
ABSOLUTE HUMIDITY 8.7 GM/KG(61.2 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

	1	2	3	4
	NYNF	LANF	LAF	NYNF
	767.1 (30.2)	767.1 (30.2)	767.1 (30.2)	767.1 (30.2)
	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)
	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
	6173.	6205.	6369.	6190.
	296.0	300.0	305.0	297.0
	292.7 (10339.)	294.3 (10394.)	302.0 (10667.)	293.5 (10368.)
	27.6/11/ 28.	27.1/11/ 27.	34.3/11/ 34.	26.1/11/ 26.
	9.2/ 1/ 9.	9.1/ 1/ 9.	9.4/ 1/ 9.	9.7/ 1/ 10.
	92.1/13/ 93.	49.8/13/ 47.	56.6/13/ 54.	46.1/13/ 43.
	.5/13/ 0.	.5/13/ 0.	.5/13/ 0.	.6/13/ 1.
	25.9/ 3/ .42	33.7/ 3/ .56	78.1/ 3/ 1.43	25.4/ 3/ .41
	1.8/ 3/ .03	1.8/ 3/ .03	2.3/ 3/ .04	2.9/ 3/ .04
	6.3/14/ 63.	6.6/14/ 66.	17.8/14/ 178.	5.9/14/ 59.
	.1/ 2/ 1.	.8/ 2/ 1.	.7/ 3/ 2.	.3/ 2/ 0.
	30.79	23.53	9.31	31.80
	19.	18.	26.	17.
	91.	45.	51.	42.
	.40	.54	1.40	.37
	62.1	65.0	175.6	58.9
	3.20	3.12	4.52	2.83
	30.94	15.54	18.10	14.24
	2126.9	2887.8	7738.1	1997.6
	34.76	36.59	101.48	33.05
	.682 (1.50)	.912 (2.01)	2.428 (5.35)	.633 (1.40)
	2.23 (3.00)	3.22 (4.32)	10.38 (13.92)	2.23 (3.00)
	1.43 (1.07)	.97 (.72)	.44 (.32)	1.26 (.94)
	13.85 (10.33)	4.83 (3.60)	1.74 (1.30)	6.37 (4.75)
	952.01 (709.91)	897.06 (668.94)	745.55 (555.96)	894.14 (666.76)
	15.56 (11.60)	11.37 (8.48)	9.78 (7.29)	14.79 (11.03)
	.305 (.502)	.283 (.466)	.234 (.385)	.283 (.466)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER
SAMPLE FLOW SCF(SCF) .920 (32.48)
MULTIPLIER FOR G/TEST 1.286
MULTIPLIER FOR G/KW HR (G/HP HR) .0712 (.0531)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL) .2763 (.1253)

20 X 20 FILTERS
SAMPLE FLOW SCF(SCF) 81.73 (2886.8)

TABLE B-11B. TEST D12-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D12	TEST NO.D12-4 RUN	
ENGINE MODEL 79 CAT 3406 DITA	DATE 3/18/80	
ENGINE 14.6 L(893. CIC) I-6	TIME 08:54	DIESEL EM-408-F
CVS NO. 10	DYNO NO. 5	BAG CART NO. 1
BAROMETER 744.3[illegible] MM HG(29.50 IN HG)	RELATIVE HUMIDITY 45. PCT	
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)	ABSOLUTE HUMIDITY 8.7 GM/KG(60.9 GRAINS/LB)	NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)
BLOWER INLET P MM. H2O(IN. H2O)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6173.	6205.	6369.	6190.
TIME SECONDS	295.9	296.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	294.2 (10393.)	295.8 (10446.)	303.6 (10723.)	295.1 (10422.)
HC SAMPLE METER/RANGE/PPM	10.7/22/ 53.	6.2/22/ 31.	5.9/22/ 29.	4.1/22/ 21.
HC BCKGRD METER/RANGE/PPM	6.9/ 1/ 7.	6.8/ 1/ 7.	7.9/ 1/ 8.	7.2/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	41.3/12/ 85.	57.1/13/ 55.	55.1/13/ 52.	46.6/13/ 44.
CO BCKGRD METER/RANGE/PPM	.6/12/ 1.	1.3/13/ 1.	1.4/13/ 1.	2.1/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	31.0/ 3/ .51	37.4/ 3/ .63	77.8/ 3/ 1.42	26.0/ 3/ .43
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	3.0/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	5.5/14/ 55.	6.4/14/ 64.	18.0/14/ 180.	5.8/14/ 58.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.5/ 2/ 1.	.9/ 3/ 3.	.6/ 2/ 1.
DILUTION FACTOR	25.42	21.00	9.36	31.06
HC CONCENTRATION PPM	47.	24.	22.	14.
CO CONCENTRATION PPM	82.	52.	49.	41.
CO2 CONCENTRATION PCT	.47	.59	1.38	.38
NOX CONCENTRATION PPM	54.5	63.5	177.9	57.6
HC MASS GRAMS	7.92	4.15	3.89	2.32
CO MASS GRAMS	28.07	17.95	17.40	14.05
CO2 MASS GRAMS	2529.5	3181.7	7690.1	2040.5
NOX MASS GRAMS	30.68	35.95	103.34	32.52
FUEL KG (LB)	.811 (1.79)	1.006 (2.22)	2.412 (5.32)	.646 (1.42)
KW HR (HP HR)	2.20 (2.95)	3.36 (4.51)	10.47 (14.04)	2.15 (2.88)
BSHC G/KW HR (G/HP HR)	3.60 (2.69)	1.23 (.92)	.37 (.28)	1.08 (.81)
BSCO G/KW HR (G/HP HR)	12.77 (9.52)	5.34 (3.98)	1.66 (1.24)	6.54 (4.88)
BSCO2 G/KW HR (G/HP HR)	1150.33 (857.80)	946.94 (706.13)	734.70 (547.87)	950.78 (708.99)
BSNOX G/KW HR (G/HP HR)	13.95 (10.41)	10.70 (7.98)	9.87 (7.36)	15.15 (11.30)
BSFC KG/KW HR (LB/HP HR)	.369 (.606)	.299 (.492)	.230 (.379)	.301 (.495)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	18.17 (24.37)
BSHC G/KW HR (G/HP HR)	1.01 (.75)
BSCO G/KW HR (G/HP HR)	4.26 (3.18)
BSCO2 G/KW HR (G/HP HR)	850. (634.)
BSNOX G/KW HR (G/HP HR)	11.14 (8.31)
BSFC KG/KW HR (LB/HP HR)	.268 (.441)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.957 (33.81)
MULTIPLIER FOR	G/TEST	1.242
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0683 (.0510)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2548 (.1156)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.32 (2872.1)

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TABLE B-11B (CONT'D). TEST D12-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D12 — TEST NO.D12-4 RUN
ENGINE MODEL 79 CAT 3406 DITA — DATE 3/18/80
ENGINE 14.6 L(893. CID) I-6 — TIME 09:34 — DIESEL EM-408-F
CVS NO. 10 — DYNO NO. 5 — BAG CART NO. 1

BAROMETER 749.30 MM HG(29.50 IN HG) — RELATIVE HUMIDITY 45. PCT
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F) — ABSOLUTE HUMIDITY 8.7 GM/KG(60.9 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	660.4 (26.0)	660.4 (26.0)	660.4 (26.0)	660.4 (26.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6173.	6205.	6379.	6191.
TIME SECONDS	296.0	300.0	305.0	297.6
TOTAL FLOW STD. CU. METRES(SCF)	293.9 (10381.)	295.5 (10436.)	303.7 (10727.)	294.8 (10412.)
HC SAMPLE METER/RANGE/PPM	26.7/11/ 27.	26.8/11/ 27.	31.8/11/ 32.	22.7/11/ 23.
HC BCKGRD METER/RANGE/PPM	6.3/ 1/ 6.	6.2/ 1/ 6.	6.1/ 1/ 6.	5.8/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	88.4/13/ 89.	46.1/13/ 43.	55.3/13/ 53.	42.7/13/ 40.
CO BCKGRD METER/RANGE/PPM	.8/13/ 1.	.6/13/ 1.	.4/13/ 0.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	25.9/ 3/ .42	32.8/ 3/ .55	76.8/ 3/ 1.40	24.5/ 3/ .40
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.6/ 3/ .04	2.8/ 3/ .04	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	5.7/14/ 57.	6.1/14/ 61.	17.7/14/ 177.	5.7/14/ 57.
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0.	.3/ 2/ 0.	.1/ 3/ 0.	.3/ 2/ 0.
DILUTION FACTOR	30.83	24.24	9.49	33.08
HC CONCENTRATION PPM	21.	21.	26.	17.
CO CONCENTRATION PPM	86.	42.	50.	38.
CO2 CONCENTRATION PCT	.38	.51	1.37	.36
NOX CONCENTRATION PPM	57.1	60.7	176.8	56.3
HC MASS GRAMS	3.49	3.56	4.61	2.91
CO MASS GRAMS	29.60	14.29	17.76	13.16
CO2 MASS GRAMS	2063.5	2747.6	7593.6	1945.5
NOX MASS GRAMS	32.11	34.29	102.71	31.76
FUEL KG (LB)	.662 (1.46)	.868 (1.91)	2.383 (5.25)	.616 (1.36)
KW HR (HP HR)	2.20 (2.95)	3.32 (4.46)	10.47 (14.04)	2.13 (2.85)
BSHC G/KW HR (G/HP HR)	1.59 (1.18)	1.07 (.80)	.44 (.33)	1.37 (1.02)
BSCO G/KW HR (G/HP HR)	13.46 (10.04)	4.30 (3.20)	1.70 (1.27)	6.18 (4.61)
BSCO2 G/KW HR (G/HP HR)	938.40 (699.77)	826.39 (616.24)	725.48 (540.99)	913.98 (681.56)
BSNOX G/KW HR (G/HP HR)	14.60 (10.89)	10.31 (7.69)	9.81 (7.32)	14.92 (11.13)
BSFC KG/KW HR (LB/HP HR)	.301 (.495)	.261 (.429)	.228 (.374)	.290 (.476)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	18.12 (24.30)
BSHC G/KW HR (G/HP HR)	.80 (.60)
BSCO G/KW HR (G/HP HR)	4.13 (3.08)
BSCO2 G/KW HR (G/HP HR)	792. (591.)
BSNOX G/KW HR (G/HP HR)	11.09 (8.27)
BSFC KG/KW HR (LB/HP HR)	.250 (.411)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	.954 (33.69)
MULTIPLIER FOR G/TEST	1.245
MULTIPLIER FOR G/KW HR (G/HP HR)	.0687 (.0513)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	.2750 (.1247)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	82.00 (2896.1)

TABLE B-12A. TEST D13-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D13 — TEST NO.D13-1 RUN
ENGINE MODEL 79 CAT 3406 PCTA — DATE 3/21/80
ENGINE 14.6 L(893. CID) I-6 — TIME 09:10 — DIESEL EM-408-F
CVS NO. 10 — DYNO NO. 5 — BAG CART NO. 1

BAROMETER 748.03 MM HG(29.45 IN HG) — RELATIVE HUMIDITY 51. PCT
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F) — ABSOLUTE HUMIDITY 9.9 GM/KG(69.3 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6178.	6260.	6399.	6193.
TIME SECONDS	296.0	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	292.8 (10343.)	296.7 (10480.)	303.3 (10712.)	293.6 (10368.)
HC SAMPLE METER/RANGE/PPM	2.8/22/ 14.	2.8/22/ 14.	3.7/22/ 18.	3.3/22/ 16.
HC BCKGRD METER/RANGE/PPM	4.9/ 1/ 5.	4.9/ 1/ 5.	4.8/ 1/ 5.	5.0/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	65.1/13/ 63.	26.1/13/ 23.	24.8/13/ 22.	34.1/13/ 31.
CO BCKGRD METER/RANGE/PPM	.4/13/ 0.	.1/13/ 0.	.3/13/ 0.	.4/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	29.0/ 3/ .48	37.9/ 3/ .64	82.7/ 3/ 1.53	25.5/ 3/ .42
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.4/ 3/ .04	2.7/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	10.0/13/ 30.	14.1/13/ 42.	44.1/13/ 132.	10.2/13/ 31.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.6/ 2/ 1.	.3/ 3/ 1.	.5/ 2/ 1.
DILUTION FACTOR	27.60	20.85	8.76	31.83
HC CONCENTRATION PPM	9.	9.	14.	11.
CO CONCENTRATION PPM	61.	23.	21.	30.
CO2 CONCENTRATION PCT	.44	.60	1.49	.37
NOX CONCENTRATION PPM	29.3	41.6	131.5	30.2
HC MASS GRAMS	1.54	1.63	2.48	1.93
CO MASS GRAMS	20.92	7.84	7.41	10.26
CO2 MASS GRAMS	2357.4	3282.0	8271.5	2015.1
NOX MASS GRAMS	16.44	23.63	76.29	16.97
FUEL KG (LB)	.747 (1.65)	1.029 (2.27)	2.587 (5.70)	.636 (1.40)
KW HR (HP HR)	1.85 (2.48)	3.45 (4.62)	10.52 (14.11)	2.09 (2.81)
BSHC G/KW HR (G/HP HR)	.84 (.62)	.47 (.35)	.24 (.18)	.92 (.69)
BSCO G/KW HR (G/HP HR)	11.33 (8.45)	2.27 (1.70)	.70 (.53)	4.90 (3.65)
BSCO2 G/KW HR (G/HP HR)	1276.29 (951.73)	951.87 (709.81)	786.29 (586.34)	962.60 (717.81)
BSNOX G/KW HR (G/HP HR)	8.90 (6.64)	6.85 (5.11)	7.25 (5.41)	8.11 (6.05)
BSFC KG/KW HR (LB/HP HR)	.405 (.665)	.299 (.491)	.246 (.404)	.304 (.499)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.91 (24.02)
BSHC G/KW HR (G/HP HR)	.42 (.32)
BSCO G/KW HR (G/HP HR)	2.59 (1.93)
BSCO2 G/KW HR (G/HP HR)	889. (663.)
BSNOX G/KW HR (G/HP HR)	7.45 (5.55)
BSFC KG/KW HR (LB/HP HR)	.279 (.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.942 (33.28)
MULTIPLIER FOR	G/TEST	1.259
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0703 (.0524)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2519 (.1143)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.17 (2866.9)

TABLE B-12A (CONT'D). TEST D13-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D13
ENGINE MODEL 79 CAT 3406 PCTA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO.D13-2 RUN 2
DATE 3/24/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)

RELATIVE HUMIDITY 38. PCT
ABSOLUTE HUMIDITY 8.2 GM/KG(57.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	678.2 (26.7)	678.2 (26.7)	678.2 (26.7)	678.2 (26.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6177.	6261.	6394.	6197.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	289.3 (10218.)	293.2 (10357.)	299.4 (10576.)	290.2 (10251.)
HC SAMPLE METER/RANGE/PPM	14.0/11/ 14.	25.9/11/ 26.	26.0/11/ 26.	23.1/11/ 23.
HC BCKGRD METER/RANGE/PPM	6.2/ 1/ 6.	5.9/ 1/ 6.	6.1/ 1/ 6.	6.0/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	54.0/13/ 51.	30.8/13/ 28.	27.4/13/ 25.	35.7/13/ 33.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	26.0/ 3/ .43	36.5/ 3/ .61	80.3/ 3/ 1.48	25.5/ 3/ .42
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.5/ 3/ .04	2.5/ 3/ .04	2.4/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.9/13/ 30.	14.2/13/ 43.	41.4/13/ 124.	9.7/13/ 29.
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1.	.9/ 2/ 1.	.3/ 3/ 1.	.7/ 2/ 1.
DILUTION FACTOR	31.06	21.67	9.05	31.77
HC CONCENTRATION PPM	8.	20.	21.	17.
CO CONCENTRATION PPM	50.	27.	24.	32.
CO2 CONCENTRATION PCT	.39	.58	1.44	.38
NOX CONCENTRATION PPM	28.7	41.8	123.3	28.4
HC MASS GRAMS	1.33	3.42	3.56	2.89
CO MASS GRAMS	16.91	9.27	8.23	10.79
CO2 MASS GRAMS	2063.9	3096.9	7907.3	2024.0
NOX MASS GRAMS	15.86	23.43	70.61	15.78
FUEL KG (LB)	.654 (1.44)	.974 (2.15)	2.475 (5.46)	.640 (1.41)
KW HR (HP HR)	2.08 (2.78)	3.36 (4.51)	10.36 (13.89)	2.02 (2.71)
BSHC G/KW HR (G/HP HR)	.64 (.48)	1.02 (.76)	.34 (.26)	1.43 (1.07)
BSCO G/KW HR (G/HP HR)	8.15 (6.08)	2.76 (2.06)	.79 (.59)	5.33 (3.98)
BSCO2 G/KW HR (G/HP HR)	994.28 (741.43)	921.70 (687.31)	763.15 (569.08)	1000.50 (746.07)
BSNOX G/KW HR (G/HP HR)	7.64 (5.70)	6.97 (5.20)	6.82 (5.08)	7.80 (5.82)
BSFC KG/KW HR (LB/HP HR)	.315 (.518)	.290 (.477)	.239 (.393)	.316 (.520)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.82 (23.90)
BSHC G/KW HR (G/HP HR)	.63 (.47)
BSCO G/KW HR (G/HP HR)	2.54 (1.89)
BSCO2 G/KW HR (G/HP HR)	847. (632.)
BSNOX G/KW HR (G/HP HR)	7.05 (5.26)
BSFC KG/KW HR (LB/HP HR)	.266 (.437)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.907 (32.02)
MULTIPLIER FOR	G/TEST	1.293
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0725 (.0541)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2726 (.1237)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.82 (2854.4)

TABLE B-12B. TEST D13-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D13 — TEST NO.D13-2 RUN 1
ENGINE MODEL 79 CAT 3406 PCTA — DATE 3/24/80
ENGINE 14.6 L(893. CID) I-6 — TIME 01:37 — DIESEL EM-408-F
CVS NO. 10 — DYNO NO. 5 — BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG) — RELATIVE HUMIDITY 44. PCT
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F) — ABSOLUTE HUMIDITY 8.9 GM/KG(62.4 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	792.5 (31.2)	792.5 (31.2)	792.5 (31.2)	792.5 (31.2)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6175.	6262.	6382.	6194.
TIME SECONDS	295.9	300.0	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	289.1 (10211.)	293.2 (10355.)	298.8 (10553.)	290.0 (10243.)
HC SAMPLE METER/RANGE/PPM	3.6/22/ 18.	4.7/22/ 24.	4.2/22/ 21.	3.0/22/ 15.
HC BCKGRD METER/RANGE/PPM	5.8/ 1/ 6.	5.7/ 1/ 6.	6.5/ 1/ 7.	6.8/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	71.0/13/ 70.	35.1/13/ 32.	29.8/13/ 27.	35.0/13/ 32.
CO BCKGRD METER/RANGE/PPM	.3/13/ 0.	.4/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	30.4/ 3/ .50	38.5/ 3/ .65	82.4/ 3/ 1.52	25.4/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.4/ 3/ .04	2.4/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	10.4/13/ 31.	14.6/13/ 44.	44.1/13/ 132.	10.0/13/ 30.
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1.	.8/ 2/ 1.	.2/ 3/ 1.	.9/ 2/ 1.
DILUTION FACTOR	26.20	20.45	8.79	31.97
HC CONCENTRATION PPM	12.	18.	15.	8.
CO CONCENTRATION PPM	68.	31.	26.	31.
CO2 CONCENTRATION PCT	.47	.62	1.49	.38
NOX CONCENTRATION PPM	30.1	43.0	131.8	29.3
HC MASS GRAMS	2.07	3.06	2.67	1.37
CO MASS GRAMS	22.86	10.55	8.94	10.53
CO2 MASS GRAMS	2475.4	3302.4	8136.8	2005.2
NOX MASS GRAMS	16.67	24.12	75.31	16.23
FUEL KG (LB)	.786 (1.73)	1.039 (2.29)	2.546 (5.61)	.632 (1.39)
KW HR (HP HR)	2.09 (2.81)	3.31 (4.44)	10.43 (13.99)	2.06 (2.76)
BSHC G/KW HR (G/HP HR)	.99 (.74)	.93 (.69)	.26 (.19)	.67 (.50)
BSCO G/KW HR (G/HP HR)	10.92 (8.14)	3.19 (2.38)	.86 (.64)	5.12 (3.82)
BSCO2 G/KW HR (G/HP HR)	1182.47 (881.77)	998.55 (744.62)	780.01 (581.65)	974.24 (726.49)
BSNOX G/KW HR (G/HP HR)	7.96 (5.94)	7.29 (5.44)	7.22 (5.38)	7.89 (5.88)
BSFC KG/KW HR (LB/HP HR)	.375 (.617)	.314 (.516)	.244 (.401)	.307 (.505)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.89 (23.99)
BSHC G/KW HR (G/HP HR)	.51 (.38)
BSCO G/KW HR (G/HP HR)	2.96 (2.20)
BSCO2 G/KW HR (G/HP HR)	890. (664.1)
BSNOX G/KW HR (G/HP HR)	7.40 (5.52)
BSFC KG/KW HR (LB/HP HR)	.280 (.460)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.942 (33.28)
MULTIPLIER FOR	G/TEST	1.243
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0695 (.0518)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2485 (.1127)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.58 (2846.2)

TABLE B-12B (CONT'D). TEST D13-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D13
ENGINE MODEL 79 CAT 3406 PCTA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO.D13-2 RUN 1
DATE 3/24/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 44. PCT
ABSOLUTE HUMIDITY 8.9 GM/KG(62.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	802.6 (31.6)	802.6 (31.6)	802.6 (31.6)	802.6 (31.6)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179.	6262.	6382.	6198.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	289.2 (10214.)	293.1 (10351.)	298.7 (10550.)	290.1 (10246.)
HC SAMPLE METER/RANGE/PPM	19.4/11/ 19.	22.9/11/ 23.	25.5/11/ 25.	29.6/11/ 30.
HC BCKGRD METER/RANGE/PPM	5.7/ 1/ 6.	5.3/ 1/ 5.	6.0/ 1/ 6.	6.2/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	63.5/13/ 62.	31.0/13/ 28.	31.7/13/ 29.	39.3/13/ 36.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.2/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	26.5/ 3/ .43	35.9/ 3/ .60	82.6/ 3/ 1.52	25.3/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.8/ 3/ .04	2.4/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.5/13/ 29.	14.4/13/ 43.	44.6/13/ 134.	9.8/13/ 30.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.7/ 2/ 1.	.1/ 3/ 0.	.8/ 2/ 1.
DILUTION FACTOR	30.33	22.07	8.76	31.96
HC CONCENTRATION PPM	14.	18.	20.	24.
CO CONCENTRATION PPM	60.	27.	27.	35.
CO2 CONCENTRATION PCT	.40	.56	1.49	.37
NOX CONCENTRATION PPM	27.8	42.7	133.4	28.8
HC MASS GRAMS	2.32	3.02	3.48	3.95
CO MASS GRAMS	20.23	9.31	9.55	11.91
CO2 MASS GRAMS	2101.8	3012.5	8156.7	1972.7
NOX MASS GRAMS	15.40	23.93	76.24	15.95
FUEL KG (LB)	.668 (1.47)	.947 (2.09)	2.553 (5.63)	.625 (1.38)
KW HR (HP HR)	2.09 (2.81)	3.32 (4.46)	10.38 (13.92)	2.06 (2.76)
BSHC G/KW HR (G/HP HR)	1.11 (.83)	.91 (.68)	.33 (.25)	1.92 (1.43)
BSCO G/KW HR (G/HP HR)	9.67 (7.21)	2.80 (2.09)	.92 (.69)	5.79 (4.31)
BSCO2 G/KW HR (G/HP HR)	1004.02 (748.70)	906.07 (675.65)	785.89 (586.04)	958.47 (714.73)
BSNOX G/KW HR (G/HP HR)	7.35 (5.48)	7.20 (5.37)	7.35 (5.48)	7.75 (5.78)
BSFC KG/KW HR (LB/HP HR)	.319 (.525)	.285 (.468)	.246 (.404)	.304 (.499)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.86 (23.94)
BSHC G/KW HR (G/HP HR)	.71 (.53)
BSCO G/KW HR (G/HP HR)	2.86 (2.13)
BSCO2 G/KW HR (G/HP HR)	854. (637.)
BSNOX G/KW HR (G/HP HR)	7.37 (5.49)
BSFC KG/KW HR (LB/HP HR)	.268 (.441)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.940 (33.20)
MULTIPLIER FOR	G/TEST	1.246
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0698 (.0520)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2599 (.1179)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.62 (2847.3)

TABLE B-13A. TEST D14-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D14
ENGINE MODEL 79 CUMMINS NTC-350
ENGINE 14.0 L(855. CID) I-6
CVS NO. 10

TEST NO.D14-2 RUN
DATE 4/ 3/80
TIME 2:07
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 740.16 MM HG(29.14 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 53. PCT
ABSOLUTE HUMIDITY 9.7 GM/KG(68.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6177.	6261.	6371.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	288.1 (10177.)	292.0 (10315.)	297.2 (10496.)	289.1 (10209.)
HC SAMPLE METER/RANGE/PPM	21.9/11/ 22.	23.8/11/ 24.	29.2/11/ 29.	25.7/11/ 26.
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5.	5.2/ 1/ 5.	6.1/ 1/ 6.	5.8/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	34.9/13/ 32.	28.8/13/ 26.	31.3/13/ 28.	23.2/13/ 21.
CO BCKGRD METER/RANGE/PPM	.7/13/ 1.	.4/13/ 0.	.4/13/ 0.	.3/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	23.6/ 3/ .38	30.7/ 3/ .51	71.5/ 3/ 1.29	20.9/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	3.4/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	2.6/14/ 26.	3.7/14/ 37.	16.1/14/ 161.	2.6/14/ 26.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.7/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	34.48	26.12	10.33	39.23
HC CONCENTRATION PPM	17.	19.	24.	20.
CO CONCENTRATION PPM	31.	25.	27.	20.
CO2 CONCENTRATION PCT	.34	.47	1.25	.29
NOX CONCENTRATION PPM	25.2	36.8	160.7	25.1
HC MASS GRAMS	2.81	3.17	4.07	3.34
CO MASS GRAMS	10.24	8.49	9.30	6.73
CO2 MASS GRAMS	1803.2	2513.3	6790.4	1546.9
NOX MASS GRAMS	13.89	20.54	91.37	13.89
FUEL KG (LB)	.570 (1.26)	.791 (1.74)	2.127 (4.69)	.489 (1.08)
KW HR (HP HR)	1.44 (1.93)	2.43 (3.26)	9.20 (12.34)	1.50 (2.01)
BSHC G/KW HR (G/HP HR)	1.95 (1.45)	1.30 (.97)	.44 (.33)	2.23 (1.67)
BSCO G/KW HR (G/HP HR)	7.10 (5.29)	3.50 (2.61)	1.01 (.75)	4.50 (3.36)
BSCO2 G/KW HR (G/HP HR)	1250.03 (932.15)	1035.30 (772.02)	738.06 (550.37)	1034.50 (771.43)
BSNOX G/KW HR (G/HP HR)	9.63 (7.18)	8.46 (6.31)	9.93 (7.41)	9.29 (6.92)
BSFC KG/KW HR (LB/HP HR)	.395 (.650)	.326 (.536)	.231 (.380)	.327 (.538)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.57 (19.55)
BSHC G/KW HR (G/HP HR)	.92 (.69)
BSCO G/KW HR (G/HP HR)	2.39 (1.78)
BSCO2 G/KW HR (G/HP HR)	869. (648.)
BSNOX G/KW HR (G/HP HR)	9.59 (7.15)
BSFC KG/KW HR (LB/HP HR)	.273 (.449)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.845 (29.86)
MULTIPLIER FOR	G/TEST	1.380
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0947 (.0706)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3468 (.1573)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.14 (2795.2)

TABLE B-13A (CONT'D). TEST D14-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D14
ENGINE MODEL 79 CUMMINS NTC-350
ENGINE 14.0 L(855. CID) I-6
CVS NO. 10

TEST NO.D14-3 RUN
DATE 4/ 4/80
TIME 02:38
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 746.76 MM HG(29.40 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 52. PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H2O(IN. H2O)	693.4 (27.3)	693.4 (27.3)	693.4 (27.3)	693.4 (27.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6176.	6260.	6377.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	290.4 (10258.)	294.4 (10398.)	299.9 (10592.)	291.4 (10293.)
HC SAMPLE METER/RANGE/PPM	20.2/11/ 20.	23.3/11/ 23.	25.4/11/ 25.	21.2/11/ 21.
HC BCKGRD METER/RANGE/PPM	4.8/ 1/ 5.	4.4/ 1/ 4.	4.2/ 1/ 4.	4.1/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	33.6/13/ 31.	26.5/13/ 24.	26.3/13/ 24.	20.5/13/ 18.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	20.8/ 3/ .34	29.3/ 3/ .48	70.1/ 3/ 1.27	20.6/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.4/ 3/ .04	2.4/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	2.8/14/ 28.	4.2/14/ 42.	17.5/14/ 175.	2.5/14/ 25.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.5/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	39.38	27.47	10.54	39.91
HC CONCENTRATION PPM	16.	19.	22.	17.
CO CONCENTRATION PPM	30.	23.	23.	18.
CO2 CONCENTRATION PCT	.30	.45	1.23	.29
NOX CONCENTRATION PPM	27.1	41.3	174.9	24.1
HC MASS GRAMS	2.60	3.23	3.73	2.89
CO MASS GRAMS	10.08	7.92	7.89	6.02
CO2 MASS GRAMS	1593.1	2414.7	6771.8	1556.3
NOX MASS GRAMS	15.08	23.25	100.33	13.46
FUEL KG (LB)	.505 (1.11)	.760 (1.68)	2.120 (4.67)	.491 (1.08)
KW HR (HP HR)	1.57 (2.10)	2.55 (3.42)	9.41 (12.62)	1.51 (2.03)
BSHC G/KW HR (G/HP HR)	1.66 (1.24)	1.27 (.95)	.43 (.30)	1.91 (1.42)
BSCO G/KW HR (G/HP HR)	6.44 (4.80)	3.11 (2.32)	.84 (.62)	3.98 (2.97)
BSCO2 G/KW HR (G/HP HR)	1017.56 (758.80)	946.65 (705.92)	719.54 (536.56)	1028.68 (767.09)
BSNOX G/KW HR (G/HP HR)	9.63 (7.18)	9.11 (6.80)	10.66 (7.95)	8.90 (6.63)
BSFC KG/KW HR (LB/HP HR)	.322 (.530)	.298 (.490)	.225 (.370)	.325 (.534)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.04 (20.17)
BSHC G/KW HR (G/HP HR)	.83 (.62)
BSCO G/KW HR (G/HP HR)	2.12 (1.58)
BSCO2 G/KW HR (G/HP HR)	820. (612.)
BSNOX G/KW HR (G/HP HR)	10.11 (7.54)
BSFC KG/KW HR (LB/HP HR)	.258 (.424)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.917 (32.39)
MULTIPLIER FOR	G/TEST	1.282
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0853 (.0636)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3308 (.1500)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.97 (2824.7)

TABLE B-13B. TEST D14-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D14
ENGINE MODEL 79 CUMMINS NTC-350
ENGINE 14.0 L(855. CID) I-6
CVS NO. 10

TEST NO.D14-3 RUN
DATE 4/ 4/80
TIME 01:20
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 747.01 MM HG(29.41 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 53. PCT
ABSOLUTE HUMIDITY 9.5 GM/KG(66.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	810.3 (31.9)	810.3 (31.9)	810.3 (31.9)	810.3 (31.9)
BLOWER INLET P MM. H2O(IN. H2O)	693.4 (27.3)	693.4 (27.3)	693.4 (27.3)	693.4 (27.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6176.	6261.	6382.	6196.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	290.5 (10260.)	294.5 (10401.)	300.2 (10602.)	291.4 (10293.)
HC SAMPLE METER/RANGE/PPM	26.1/11/ 26.	25.2/11/ 25.	30.0/11/ 30.	25.1/11/ 25.
HC BCKGRD METER/RANGE/PPM	5.0/ 1/ 5.	6.1/ 1/ 6.	7.2/ 1/ 7.	6.6/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	36.2/13/ 33.	26.1/13/ 23.	29.4/13/ 27.	21.4/13/ 19.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	24.5/ 3/ .40	31.3/ 3/ .52	74.7/ 3/ 1.36	20.6/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	2.9/14/ 29.	4.1/14/ 41.	16.8/14/ 168.	3.0/14/ 30.
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0.	.4/ 2/ 0.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	33.11	25.59	9.81	39.86
HC CONCENTRATION PPM	21.	19.	24.	19.
CO CONCENTRATION PPM	32.	23.	25.	19.
CO2 CONCENTRATION PCT	.36	.48	1.32	.29
NOX CONCENTRATION PPM	28.3	40.4	167.3	29.0
HC MASS GRAMS	3.56	3.28	4.08	3.13
CO MASS GRAMS	10.91	7.79	8.86	6.29
CO2 MASS GRAMS	1909.2	2568.5	7258.8	1548.2
NOX MASS GRAMS	15.73	22.77	96.09	16.17
FUEL KG (LB)	.605 (1.33)	.808 (1.78)	2.273 (5.01)	.489 (1.08)
KW HR (HP HR)	1.44 (1.93)	2.39 (3.21)	9.46 (12.69)	1.51 (2.03)
BSHC G/KW HR (G/HP HR)	2.47 (1.84)	1.37 (1.02)	.43 (.32)	2.07 (1.54)
BSCO G/KW HR (G/HP HR)	7.56 (5.64)	3.26 (2.43)	.94 (.70)	4.16 (3.10)
BSCO2 G/KW HR (G/HP HR)	1323.51 (986.94)	1073.58 (800.57)	766.98 (571.94)	1023.38 (763.14)
BSNOX G/KW HR (G/HP HR)	10.91 (8.13)	9.52 (7.10)	10.15 (7.57)	10.69 (7.97)
BSFC KG/KW HR (LB/HP HR)	.419 (.689)	.338 (.556)	.240 (.395)	.323 (.532)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.81 (19.86)
BSHC G/KW HR (G/HP HR)	.95 (.71)
BSCO G/KW HR (G/HP HR)	2.29 (1.70)
BSCO2 G/KW HR (G/HP HR)	897. (669.)
BSNOX G/KW HR (G/HP HR)	10.18 (7.59)
BSFC KG/KW HR (LB/HP HR)	.282 (.463)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.913 (32.23)
MULTIPLIER FOR	G/TEST	1.289
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0870 (.0649)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3088 (.1401)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.86 (2820.5)

TABLE B-13B (CONT'D). TEST D14-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D14-3 RUN
DATE 4/ 4/80
TIME 02:00
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

RELATIVE HUMIDITY 52. PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO. D14
ENGINE MODEL 79 CUMMINS NTC-350
ENGINE 14.0 L(855. CID) I-6
CVS NO. 10

BAROMETER 747.01 MM HG(29.41 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H2O(IN. H2O)	693.4 (27.3)	693.4 (27.3)	693.4 (27.3)	693.4 (27.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6177.	6260.	6376.	6196.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	290.6 (10265.)	294.5 (10403.)	300.0 (10595.)	291.5 (10296.)
HC SAMPLE METER/RANGE/PPM	20.7/11/ 21.	24.3/11/ 24.	25.3/11/ 25.	20.9/11/ 21.
HC BCKGRD METER/RANGE/PPM	5.5/ 1/ 6.	5.4/ 1/ 5.	5.3/ 1/ 5.	4.9/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	34.2/13/ 31.	25.5/13/ 23.	26.9/13/ 24.	19.3/13/ 17.
CO BCKGRD METER/RANGE/PPM	-1/13/ 0.	-1/13/ 0.	-1/13/ 0.	-1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	21.0/ 3/ .34	29.4/ 3/ .48	72.7/ 3/ 1.32	19.8/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.8/ 3/ .04	3.0/ 3/ .05	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	2.5/14/ 25.	4.0/14/ 40.	17.2/14/ 172.	2.5/14/ 25.
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0.	.4/ 2/ 0.	.1/ 3/ 0.	.5/ 2/ 1.
DILUTION FACTOR	38.98	27.37	10.12	41.61
HC CONCENTRATION PPM	15.	19.	20.	16.
CO CONCENTRATION PPM	30.	22.	23.	17.
CO2 CONCENTRATION PCT	.30	.44	1.28	.28
NOX CONCENTRATION PPM	24.4	39.9	171.6	24.2
HC MASS GRAMS	2.57	3.25	3.54	2.72
CO MASS GRAMS	10.28	7.61	8.07	5.65
CO2 MASS GRAMS	1572.4	2393.3	7020.4	1491.9
NOX MASS GRAMS	13.58	22.50	98.46	13.52
FUEL KG (LB)	.498 (1.10)	.754 (1.66)	2.198 (4.85)	.471 (1.04)
KW HR (HP HR)	1.57 (2.10)	2.53 (3.40)	9.39 (12.60)	1.55 (2.08)
BSHC G/KW HR (G/HP HR)	1.64 (1.22)	1.28 (.96)	.38 (.28)	1.76 (1.31)
BSCO G/KW HR (G/HP HR)	6.57 (4.90)	3.01 (2.24)	.86 (.64)	3.65 (2.72)
BSCO2 G/KW HR (G/HP HR)	1004.29 (748.90)	944.80 (704.54)	747.35 (557.30)	963.75 (718.67)
BSNOX G/KW HR (G/HP HR)	8.67 (6.47)	8.88 (6.62)	10.48 (7.82)	8.73 (6.51)
BSFC KG/KW HR (LB/HP HR)	.318 (.523)	.298 (.489)	.234 (.385)	.304 (.500)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.04 (20.17)
BSHC G/KW HR (G/HP HR)	.80 (.60)
BSCO G/KW HR (G/HP HR)	2.10 (1.57)
BSCO2 G/KW HR (G/HP HR)	830. (619.)
BSNOX G/KW HR (G/HP HR)	9.84 (7.34)
BSFC KG/KW HR (LB/HP HR)	.261 (.429)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.911 (32.17)
MULTIPLIER FOR	G/TEST	1.292
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0859 (.0640)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3295 (.1495)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	80.09 (2828.9)

TABLE B-14A. TEST D15-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D15
ENGINE MODEL 79 IH DT-466
ENGINE 7.6 L(466. CID) I-6
CVS NO. 10

TEST NO.D15-1 RUN
DATE 4/16/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 50. PCT
ABSOLUTE HUMIDITY 10.2 GM/KG(71.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)
BLOWER INLET P MM. H2O(IN. H2O)	238.8 (9.4)	238.8 (9.4)	238.8 (9.4)	238.8 (9.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	3325.	3369.	3427.	3336.
TIME SECONDS	296.0	299.8	305.0	298.9
TOTAL FLOW STD. CU. METRES(SCF)	176.4 (6229.)	178.7 (6312.)	181.8 (6420.)	177.0 (6252.)
HC SAMPLE METER/RANGE/PPM	35.0/11/ 35.	32.1/11/ 32.	39.5/11/ 39.	26.2/11/ 26.
HC BCKGRD METER/RANGE/PPM	4.8/ 1/ 5.	4.8/ 1/ 5.	4.8/ 1/ 5.	4.8/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	55.8/13/ 53.	42.0/13/ 39.	33.5/13/ 31.	28.8/13/ 26.
CO BCKGRD METER/RANGE/PPM	.2/13/ 0.	.4/13/ 0.	.2/13/ 0.	.4/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	25.7/ 3/ .42	34.2/ 3/ .57	74.8/ 3/ 1.35	21.0/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	2.4/ 3/ .04	2.9/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	3.2/14/ 32.	4.2/14/ 42.	12.2/14/ 122.	2.4/14/ 24.
NOX BCKGRD METER/RANGE/PPM	1.3/ 2/ 1.	1.0/ 2/ 1.	.2/ 3/ 1.	.9/ 2/ 1.
DILUTION FACTOR	31.27	23.18	9.79	38.97
HC CONCENTRATION PPM	30.	27.	35.	22.
CO CONCENTRATION PPM	52.	38.	29.	25.
CO2 CONCENTRATION PCT	.37	.54	1.32	.30
NOX CONCENTRATION PPM	30.8	40.8	121.7	23.2
HC MASS GRAMS	3.09	2.83	3.69	2.20
CO MASS GRAMS	10.64	7.81	6.15	5.17
CO2 MASS GRAMS	1197.9	1754.5	4402.8	977.1
NOX MASS GRAMS	10.41	13.96	42.33	7.86
FUEL KG (LB)	.382 (.84)	.554 (1.22)	1.380 (3.04)	.310 (.68)
KW HR (HP HR)	.99 (1.32)	1.57 (2.10)	5.31 (7.12)	.93 (1.25)
BSHC G/KW HR (G/HP HR)	3.14 (2.34)	1.81 (1.35)	.69 (.52)	2.36 (1.76)
BSCO G/KW HR (G/HP HR)	10.80 (8.05)	4.99 (3.72)	1.16 (.86)	5.54 (4.13)
BSCO2 G/KW HR (G/HP HR)	1216.00 (906.77)	1120.63 (835.65)	828.74 (617.99)	1048.06 (781.54)
BSNOX G/KW HR (G/HP HR)	10.57 (7.88)	8.92 (6.65)	7.97 (5.94)	8.43 (6.29)
BSFC KG/KW HR (LB/HP HR)	.388 (.638)	.354 (.582)	.260 (.427)	.332 (.546)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.80 (11.80)
BSHC G/KW HR (G/HP HR)	1.34 (1.00)
BSCO G/KW HR (G/HP HR)	3.38 (2.52)
BSCO2 G/KW HR (G/HP HR)	947. (706.)
BSNOX G/KW HR (G/HP HR)	8.48 (6.32)
BSFC KG/KW HR (LB/HP HR)	.299 (.491)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.870 (30.74)
MULTIPLIER FOR	G/TEST	.820
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0932 (.0695)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3123 (.1417)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.67 (2884.7)

TABLE B-14A (CONT'D). TEST D15-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D15
ENGINE MODEL 79 IH DT-466
ENGINE 7.6 L(466. CID) I-6
CVS NO. 10

TEST NO.D15-1 RUN
DATE 4/16/80
TIME 02:10 — DIESEL EM-408-F
DYNO NO. 5 — BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 50. PCT
ABSOLUTE HUMIDITY 10.2 GM/KG(71.1 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)
BLOWER INLET P MM. H2O(IN. H2O)	231.1 (9.1)	231.1 (9.1)	231.1 (9.1)	231.1 (9.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3324.	3368.	3427.	3336.
TIME SECONDS	295.7	299.7	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	176.7 (6242.)	179.1 (6324.)	182.2 (6435.)	177.4 (6264.)
HC SAMPLE METER/RANGE/PPM	21.2/11/ 21.	26.7/11/ 27.	36.8/11/ 37.	25.1/11/ 25.
HC BCKGRD METER/RANGE/PPM	4.8/ 1/ 5.	4.4/ 1/ 4.	4.1/ 1/ 4.	3.9/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	33.0/13/ 30.	32.4/13/ 29.	32.8/13/ 30.	30.3/13/ 27.
CO BCKGRD METER/RANGE/PPM	.3/13/ 0.	.2/13/ 0.	.4/13/ 0.	.3/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.5/ 3/ .36	31.9/ 3/ .53	74.5/ 3/ 1.36	22.1/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.9/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	2.4/14/ 24.	3.7/14/ 37.	11.8/14/ 118.	2.1/14/ 21.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.8/ 2/ 1.	.1/ 3/ 0.	.9/ 2/ 1.
DILUTION FACTOR	36.28	25.04	9.83	36.95
HC CONCENTRATION PPM	17.	22.	33.	21.
CO CONCENTRATION PPM	29.	29.	28.	27.
CO2 CONCENTRATION PCT	.32	.49	1.32	.32
NOX CONCENTRATION PPM	23.2	36.2	117.3	20.5
HC MASS GRAMS	1.68	2.32	3.43	2.18
CO MASS GRAMS	5.99	5.94	6.00	5.48
CO2 MASS GRAMS	1044.4	1611.7	4392.1	1025.8
NOX MASS GRAMS	7.84	12.41	40.88	6.94
FUEL KG (LB)	.330 (.73)	.508 (1.12)	1.377 (3.04)	.325 (.72)
KW HR (HP HR)	.95 (1.27)	1.58 (2.12)	5.31 (7.12)	.93 (1.25)
BSHC G/KW HR (G/HP HR)	1.77 (1.32)	1.47 (1.09)	.65 (.49)	2.33 (1.74)
BSCO G/KW HR (G/HP HR)	6.30 (4.70)	3.75 (2.80)	1.13 (.84)	5.88 (4.39)
BSCO2 G/KW HR (G/HP HR)	1099.40 (819.83)	1017.97 (759.10)	826.74 (616.50)	1100.21 (820.42)
BSNOX G/KW HR (G/HP HR)	8.25 (6.15)	7.84 (5.84)	7.69 (5.74)	7.45 (5.55)
BSFC KG/KW HR (LB/HP HR)	.348 (.572)	.321 (.528)	.259 (.426)	.348 (.573)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.78 (11.77)
BSHC G/KW HR (G/HP HR)	1.10 (.82)
BSCO G/KW HR (G/HP HR)	2.67 (1.99)
BSCO2 G/KW HR (G/HP HR)	920. (686.)
BSNOX G/KW HR (G/HP HR)	7.75 (5.78)
BSFC KG/KW HR (LB/HP HR)	.289 (.476)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.911 (32.19)
MULTIPLIER FOR	G/TEST	.785
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0894 (.0667)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3090 (.1402)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.81 (2889.4)

TABLE B-14B. TEST D15-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D15
ENGINE MODEL 79 IH DT-466
ENGINE 7.5 L(466. CID) I-6
CVS NO. 10

TEST NO.D15-2 RUN
DATE 4/17/80
TIME 8:57
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 54. PCT
ABSOLUTE HUMIDITY 11.2 GM/KG(78.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)
BLOWER INLET P MM. H2O(IN. H2O)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	3324.	3368.	3427.	3335.
TIME SECONDS	295.9	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	177.5 (6271.)	179.9 (6354.)	183.0 (6465.)	178.1 (6292.)
HC SAMPLE METER/RANGE/PPM	35.9/11/ 36.	32.7/11/ 33.	39.4/11/ 39.	26.2/11/ 26.
HC BCKGRD METER/RANGE/PPM	4.2/ 1/ 4.	3.9/ 1/ 4.	3.9/ 1/ 4.	3.8/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	58.5/13/ 56.	43.3/13/ 40.	35.0/13/ 32.	30.1/13/ 27.
CO BCKGRD METER/RANGE/PPM	.4/13/ 0.	.1/13/ 0.	.3/13/ 0.	.4/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	25.8/ 3/ .42	34.9/ 3/ .58	75.4/ 3/ 1.37	21.8/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	3.4/14/ 34.	4.5/14/ 45.	12.5/14/ 125.	2.8/14/ 28.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.8/ 2/ 1.	.1/ 3/ 0.	.8/ 2/ 1.
DILUTION FACTOR	31.12	22.67	9.73	37.47
HC CONCENTRATION PPM	32.	29.	36.	23.
CO CONCENTRATION PPM	54.	39.	30.	26.
CO2 CONCENTRATION PCT	.38	.54	1.33	.31
NOX CONCENTRATION PPM	32.8	43.9	124.8	26.9
HC MASS GRAMS	3.26	3.01	3.79	2.32
CO MASS GRAMS	11.24	8.17	6.47	5.44
CO2 MASS GRAMS	1250.4	1788.9	4474.9	1008.5
NOX MASS GRAMS	11.14	15.10	43.72	9.16
FUEL KG (LB)	.399 (.88)	.565 (1.25)	1.403 (3.09)	.320 (.70)
KW HR (HP HR)	.95 (1.27)	1.60 (2.15)	5.40 (7.24)	.95 (1.27)
BSHC G/KW HR (G/HP HR)	3.43 (2.56)	1.88 (1.40)	.70 (.52)	2.44 (1.82)
BSCO G/KW HR (G/HP HR)	11.83 (8.82)	5.10 (3.81)	1.20 (.89)	5.73 (4.27)
BSCO2 G/KW HR (G/HP HR)	1316.34 (981.60)	1117.47 (833.30)	828.60 (617.89)	1061.70 (791.71)
BSNOX G/KW HR (G/HP HR)	11.73 (8.75)	9.44 (7.04)	8.09 (6.04)	9.64 (7.19)
BSFC KG/KW HR (LB/HP HR)	.420 (.690)	.353 (.580)	.260 (.427)	.336 (.553)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.90 (11.94)
BSHC G/KW HR (G/HP HR)	1.39 (1.04)
BSCO G/KW HR (G/HP HR)	3.52 (2.62)
BSCO2 G/KW HR (G/HP HR)	957. (714.)
BSNOX G/KW HR (G/HP HR)	8.89 (6.63)
BSFC KG/KW HR (LB/HP HR)	.302 (.496)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	.906 (31.99)
MULTIPLIER FOR G/TEST	.793
MULTIPLIER FOR G/KW HR (G/HP HR)	.0891 (.0665)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	.2953 (.1339)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	82.09 (2899.6)

TABLE B-14B (CONT'D). TEST D15-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D15
ENGINE MODEL 79 IH DT-466
ENGINE 7.6 L(466. CID) I-6
CVS NO. 10

TEST NO.D15-2 RUN
DATE 4/17/80
TIME 9:36
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 51. PCT
ABSOLUTE HUMIDITY 10.6 GM/KG(74.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)
BLOWER INLET P MM. H2O(IN. H2O)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	3325.	3368.	3427.	3332.
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	177.4 (6266.)	179.7 (6348.)	182.9 (6459.)	177.8 (6280.)
HC SAMPLE METER/RANGE/PPM	20.8/11/ 21.	26.6/11/ 27.	37.2/11/ 37.	25.3/11/ 25.
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5.	5.0/ 1/ 5.	4.7/ 1/ 5.	4.5/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	29.6/13/ 27.	34.6/13/ 32.	34.8/13/ 32.	29.9/13/ 27.
CO BCKGRD METER/RANGE/PPM	.4/13/ 0.	.1/13/ 0.	.4/13/ 0.	.4/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.3/ 3/ .36	32.3/ 3/ .54	75.5/ 3/ 1.38	21.5/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	2.4/14/ 24.	3.6/14/ 36.	11.7/14/ 117.	2.4/14/ 24.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.6/ 2/ 1.	.2/ 3/ 1.	.9/ 2/ 1.
DILUTION FACTOR	36.65	24.70	9.69	38.03
HC CONCENTRATION PPM	16.	22.	33.	21.
CO CONCENTRATION PPM	26.	31.	30.	26.
CO2 CONCENTRATION PCT	.32	.50	1.34	.31
NOX CONCENTRATION PPM	23.7	35.9	116.6	23.4
HC MASS GRAMS	1.61	2.26	3.47	2.15
CO MASS GRAMS	5.33	6.42	6.41	5.40
CO2 MASS GRAMS	1037.3	1641.4	4481.9	994.8
NOX MASS GRAMS	8.06	12.35	40.77	7.95
FUEL KG (LB)	.328 (.72)	.518 (1.14)	1.405 (3.10)	.315 (.69)
KW HR (HP HR)	.93 (1.25)	1.58 (2.12)	5.38 (7.22)	.95 (1.27)
BSHC G/KW HR (G/HP HR)	1.73 (1.29)	1.43 (1.06)	.65 (.48)	2.26 (1.69)
BSCO G/KW HR (G/HP HR)	5.72 (4.26)	4.05 (3.02)	1.19 (.89)	5.69 (4.24)
BSCO2 G/KW HR (G/HP HR)	1112.61 (829.67)	1036.73 (773.09)	832.61 (620.88)	1047.20 (780.89)
BSNOX G/KW HR (G/HP HR)	8.64 (6.44)	7.80 (5.82)	7.57 (5.65)	8.37 (6.24)
BSFC KG/KW HR (LB/HP HR)	.352 (.578)	.327 (.537)	.261 (.429)	.332 (.545)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.85 (11.87)
BSHC G/KW HR (G/HP HR)	1.07 (.80)
BSCO G/KW HR (G/HP HR)	2.66 (1.99)
BSCO2 G/KW HR (G/HP HR)	922. (687.)
BSNOX G/KW HR (G/HP HR)	7.81 (5.83)
BSFC KG/KW HR (LB/HP HR)	.290 (.477)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	.916 (32.36)
MULTIPLIER FOR G/TEST	.783
MULTIPLIER FOR G/KW HR (G/HP HR)	.0885 (.0660)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	.3054 (.1385)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	81.36 (2873.5)

TABLE B-15A. TEST D16-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D16
ENGINE MODEL 79 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-2 RUN
DATE 4/30/80
TIME 1143
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 733.04 MM HG(28.86 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 51. PCT
ABSOLUTE HUMIDITY 10.5 GM/KG(73.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	703.6 (27.7)	703.6 (27.7)	703.6 (27.7)
BLOWER INLET P MM. H2O(IN. H2O)	609.5 (23.8)	609.5 (23.8)	609.5 (23.8)	609.5 (23.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	5743.	5820.	5921.	5762.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	268.4 (9480.)	272.0 (9607.)	276.7 (9773.)	269.3 (9511.)
HC SAMPLE METER/RANGE/PPM	17.7/11/ 18.	25.8/11/ 26.	95.7/11/ 96.	25.8/11/ 26.
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5.	5.2/ 1/ 5.	5.2/ 1/ 5.	5.1/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	31.0/13/ 28.	30.1/13/ 27.	39.2/13/ 36.	58.0/13/ 56.
CO BCKGRD METER/RANGE/PPM	.2/13/ 0.	.1/13/ 0.	.1/13/ 0.	.6/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	25.0/ 3/ .91	33.2/ 3/ .55	75.0/ 3/ 1.37	23.9/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.7/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.0/14/ 90.	5.7/14/ 57.	17.6/14/ 176.	9.6/14/ 96.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.3/ 2/ 0.	.1/ 3/ 0.	.7/ 2/ 1.
DILUTION FACTOR	32.52	24.00	9.75	34.55
HC CONCENTRATION PPM	13.	21.	91.	21.
CO CONCENTRATION PPM	27.	26.	34.	54.
CO2 CONCENTRATION PCT	.37	.51	1.33	.34
NOX CONCENTRATION PPM	39.9	56.8	175.8	99.9
HC MASS GRAMS	1.96	3.26	6.56	3.29
CO MASS GRAMS	8.52	8.37	11.12	16.86
CO2 MASS GRAMS	1806.8	2557.9	6729.9	1668.2
NOX MASS GRAMS	20.23	29.57	93.07	23.13
FUEL KG (LB)	.570 (1.26)	.805 (1.78)	2.112 (4.66)	.532 (1.17)
KW HR (HP HR)	1.67 (2.24)	2.64 (3.54)	8.69 (11.65)	1.64 (2.19)
BSHC G/KW HR (G/HP HR)	1.17 (.88)	1.24 (.92)	.75 (.56)	1.98 (1.48)
BSCO G/KW HR (G/HP HR)	5.10 (3.80)	3.17 (2.36)	1.28 (.95)	10.31 (7.69)
BSCO2 G/KW HR (G/HP HR)	1081.13 (806.20)	969.37 (722.86)	779.93 (577.99)	1019.68 (760.38)
BSNOX G/KW HR (G/HP HR)	12.11 (9.03)	11.21 (8.36)	10.71 (7.99)	14.14 (10.54)
BSFC KG/KW HR (LB/HP HR)	.341 (.561)	.305 (.502)	.293 (.399)	.325 (.535)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.64 (19.63)
BSHC G/KW HR (G/HP HR)	1.03 (.77)
BSCO G/KW HR (G/HP HR)	3.07 (2.29)
BSCO2 G/KW HR (G/HP HR)	872. (650.)
BSNOX G/KW HR (G/HP HR)	11.34 (8.46)
BSFC KG/KW HR (LB/HP HR)	.275 (.451)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.910 (32.14)
MULTIPLIER FOR	G/TEST	1.194
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0816 (.0608)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2970 (.1347)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.40 (2910.5)

TABLE B-15A (CONT'D). TEST D16-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D16
ENGINE MODEL 79 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-2 RUN
DATE 4/30/80
TIME 2121
DYNO NO. 5

DIESEL EM-508-F
BAG CART NO. 1

BAROMETER 733.04 MM HG(28.86 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 47. PCT
ABSOLUTE HUMIDITY 9.6 GM/KG(67.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	706.1 (27.8)	706.1 (27.8)	706.1 (27.8)	706.1 (27.8)
BLOWER INLET P MM. H2O(IN. H2O)	609.5 (23.8)	609.5 (23.8)	609.5 (23.8)	609.5 (23.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	5744.	5822.	5922.	5763.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	268.3 (9476.)	271.9 (9605.)	276.6 (9769.)	269.2 (9507.)
HC SAMPLE METER/RANGE/PPM	25.8/11/ 26.	28.1/11/ 28.	95.7/11/ 96.	25.1/11/ 25.
HC BCKGRD METER/RANGE/PPM	4.9/ 1/ 5.	4.9/ 1/ 5.	4.9/ 1/ 5.	4.9/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	71.5/13/ 70.	93.3/13/ 90.	39.7/13/ 37.	60.8/13/ 59.
CO BCKGRD METER/RANGE/PPM	.8/13/ 1.	.6/13/ 1.	.3/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	23.5/ 3/ .38	32.4/ 3/ .59	75.0/ 3/ 1.37	23.6/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.9/14/ 99.	6.3/14/ 63.	18.4/14/ 184.	9.7/14/ 97.
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0.	.1/ 2/ 0.	.3/ 3/ 1.	.5/ 2/ 1.
DILUTION FACTOR	39.27	24.57	9.75	34.22
HC CONCENTRATION PPM	21.	23.	41.	20.
CO CONCENTRATION PPM	68.	39.	35.	57.
CO2 CONCENTRATION PCT	.34	.50	1.33	.34
NOX CONCENTRATION PPM	99.2	63.3	182.9	96.5
HC MASS GRAMS	3.26	3.67	6.59	3.16
CO MASS GRAMS	21.28	12.26	11.23	17.93
CO2 MASS GRAMS	1670.6	2970.5	6720.2	1692.0
NOX MASS GRAMS	22.67	32.91	96.75	23.97
FUEL KG (LB)	.535 (1.18)	.780 (1.72)	2.109 (4.65)	.540 (1.19)
KW HR (HP HR)	1.65 (2.22)	2.69 (3.61)	8.67 (11.63)	1.62 (2.17)
BSHC G/KW HR (G/HP HR)	1.97 (1.47)	1.36 (1.02)	.76 (.57)	1.95 (1.46)
BSCO G/KW HR (G/HP HR)	12.87 (9.60)	4.56 (3.40)	1.30 (.97)	11.08 (8.26)
BSCO2 G/KW HR (G/HP HR)	1010.26 (753.35)	917.89 (684.47)	774.88 (577.83)	1045.47 (779.61)
BSNOX G/KW HR (G/HP HR)	13.71 (10.22)	12.23 (9.12)	11.16 (8.32)	14.81 (11.04)
BSFC KG/KW HR (LB/HP HR)	.323 (.532)	.290 (.477)	.243 (.400)	.334 (.548)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.64 (19.63)
BSHC G/KW HR (G/HP HR)	1.14 (.85)
BSCO G/KW HR (G/HP HR)	4.28 (3.19)
BSCO2 G/KW HR (G/HP HR)	858. (640.)
BSNOX G/KW HR (G/HP HR)	12.05 (8.98)
BSFC KG/KW HR (LB/HP HR)	.271 (.445)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.920 (32.51)
MULTIPLIER FOR	G/TEST	1.180
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0806 (.0601)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2977 (.1350)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.01 (2755.3)

TABLE B-15B. TEST D16-4 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D16
ENGINE MODEL 74 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-4 RUN
DATE 5/ 3/80
TIME 1104
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 54. PCT
ABSOLUTE HUMIDITY 10.6 GM/KG(74.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)
BLOWER INLET P MM. H20(IN. H20)	614.7 (24.2)	614.7 (24.2)	614.7 (24.2)	614.7 (24.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)
BLOWER REVOLUTIONS	5742.	5821.	5920.	5761.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	271.9 (9603.)	275.6 (9735.)	280.3 (9900.)	272.8 (9634.)
HC SAMPLE METER/RANGE/PPM	18.4/11/ 18.	25.1/11/ 25.	42.6/11/ 43.	26.1/11/ 26.
HC BCKGRD METER/RANGE/PPM	10.1/ 1/ 10.	8.4/ 1/ 8.	7.9/ 1/ 8.	7.7/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	31.5/13/ 29.	29.0/13/ 26.	41.6/13/ 39.	56.1/13/ 54.
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1.	1.1/13/ 1.	.9/13/ 1.	1.5/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	28.1/ 3/ .46	33.7/ 3/ .56	76.7/ 3/ 1.40	23.7/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.7/ 3/ .06	3.3/ 3/ .05	3.3/ 3/ .05	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	3.6/14/ 36.	5.3/14/ 53.	17.2/14/ 172.	4.4/14/ 44.
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0.	.4/ 2/ 0.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	28.72	23.63	9.51	34.11
HC CONCENTRATION PPM	9.	17.	36.	19.
CO CONCENTRATION PPM	27.	25.	36.	51.
CO2 CONCENTRATION PCT	.41	.51	1.36	.34
NOX CONCENTRATION PPM	36.4	52.4	171.6	43.1
HC MASS GRAMS	1.36	2.71	5.74	2.44
CO MASS GRAMS	8.52	7.88	11.79	16.20
CO2 MASS GRAMS	2027.3	2592.9	6961.9	1715.8
NOX MASS GRAMS	14.93	27.64	92.00	22.47
FUEL KG (LB)	.638 (1.41)	.816 (1.80)	2.184 (4.81)	.546 (1.20)
KW HR (HP HR)	1.62 (2.17)	2.60 (3.49)	8.71 (11.68)	1.65 (2.22)
BSHC G/KW HR (G/HP HR)	.84 (.63)	1.04 (.78)	.66 (.49)	1.78 (1.32)
BSCO G/KW HR (G/HP HR)	5.27 (3.93)	3.03 (2.26)	1.35 (1.01)	9.79 (7.30)
BSCO2 G/KW HR (G/HP HR)	1252.68 (934.12)	995.93 (742.66)	799.51 (596.19)	1037.62 (773.75)
BSNOX G/KW HR (G/HP HR)	11.69 (8.72)	10.61 (7.92)	10.57 (7.88)	13.59 (10.13)
BSFC KG/KW HR (LB/HP HR)	.394 (.648)	.313 (.515)	.251 (.412)	.330 (.543)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.58 (19.56)
BSHC G/KW HR (G/HP HR)	.87 (.65)
BSCO G/KW HR (G/HP HR)	3.04 (2.27)
BSCO2 G/KW HR (G/HP HR)	912. (680.)
BSNOX G/KW HR (G/HP HR)	11.04 (8.23)
BSFC KG/KW HR (LB/HP HR)	.287 (.472)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.866 (30.60)
MULTIPLIER FOR	G/TEST	1.270
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0871 (.0650)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3037 (.1377)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.19 (2832.4)

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TABLE B-15B (CONT'D). TEST D16-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 016
ENGINE MODEL 79 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-4 RUN
DATE 5/ 3/80
TIME 1:44
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 740.41 MM HG(29.15 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)
BLOWER INLET P MM. H20(IN. H20)	617.2 (24.3)	617.2 (24.3)	617.2 (24.3)	617.2 (24.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)
BLOWER REVOLUTIONS	5742.	5821.	5920.	5762.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	271.4 (9586.)	275.1 (9718.)	279.8 (9883.)	272.3 (9619.)
HC SAMPLE METER/RANGE/PPM	18.9/11/ 19.	24.4/11/ 24.	41.4/11/ 41.	24.0/11/ 24.
HC BCKGRD METER/RANGE/PPM	8.8/ 1/ 9.	7.2/ 1/ 7.	6.3/ 1/ 6.	5.5/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	48.9/13/ 46.	37.4/13/ 34.	36.6/13/ 34.	56.9/13/ 54.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.0/ 3/ .36	31.1/ 3/ .52	79.0/ 3/ 1.35	23.0/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.3/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	4.1/14/ 41.	5.9/14/ 59.	17.2/14/ 172.	4.5/14/ 45.
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0.	.1/ 2/ 0.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	37.00	25.72	9.90	35.20
HC CONCENTRATION PPM	10.	18.	36.	19.
CO CONCENTRATION PPM	45.	33.	32.	53.
CO2 CONCENTRATION PCT	.32	.48	1.31	.33
NOX CONCENTRATION PPM	41.3	58.9	171.6	44.0
HC MASS GRAMS	1.61	2.78	5.76	2.43
CO MASS GRAMS	14.15	10.67	10.43	16.80
CO2 MASS GRAMS	1598.4	2426.3	6692.5	1645.1
NOX MASS GRAMS	21.42	31.02	91.89	22.94
FUEL KG (LB)	.507 (1.12)	.765 (1.69)	2.099 (4.63)	.529 (1.16)
KW HR (HP HR)	1.64 (2.19)	2.67 (3.59)	8.71 (11.68)	1.64 (2.19)
BSHC G/KW HR (G/HP HR)	.99 (.74)	1.04 (.77)	.66 (.49)	1.79 (1.34)
BSCO G/KW HR (G/HP HR)	8.65 (6.45)	3.99 (2.98)	1.20 (.89)	10.27 (7.66)
BSCO2 G/KW HR (G/HP HR)	977.00 (728.55)	907.40 (676.65)	768.57 (573.12)	1005.58 (749.86)
BSNOX G/KW HR (G/HP HR)	13.09 (9.76)	11.60 (8.65)	10.55 (7.86)	14.02 (10.46)
BSFC KG/KW HR (LB/HP HR)	.310 (.510)	.286 (.470)	.241 (.396)	.321 (.527)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.65 (19.65)
BSHC G/KW HR (G/HP HR)	.49 (.67)
BSCO G/KW HR (G/HP HR)	3.55 (2.65)
BSCO2 G/KW HR (G/HP HR)	849. (629.)
BSNOX G/KW HR (G/HP HR)	11.91 (8.51)
BSFC KG/KW HR (LB/HP HR)	.266 (.437)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.877 (30.98)
MULTIPLIER FOR	G/TEST	1.253
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0855 (.0637)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3216 (.1459)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.41 (2804.9)

TABLE B-16A. TEST D17-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

TEST NO.D17-1 RUN
DATE 5/ 7/80
TIME 09:13
DYNO NO. 5

DIESEL EM-408-E
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 61. PCT
ABSOLUTE HUMIDITY 10.5 GM/KG(73.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	800.1 (31.5)	800.1 (31.5)	800.1 (31.5)	800.1 (31.5)
BLOWER INLET P MM. H2O(IN. H2O)	685.8 (27.0)	685.8 (27.0)	685.8 (27.0)	685.8 (27.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6176.	6260.	6370.	6197.
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	288.0 (10174.)	292.0 (10312.)	297.1 (10493.)	289.0 (10208.)
HC SAMPLE METER/RANGE/PPM	4.2/22/ 21.	4.6/22/ 23.	7.3/22/ 36.	4.8/22/ 24.
HC BCKGRD METER/RANGE/PPM	10.0/ 1/ 10.	9.4/ 1/ 9.	8.9/ 1/ 9.	8.0/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	31.0/13/ 28.	24.2/13/ 22.	31.3/13/ 28.	56.7/13/ 54.
CO BCKGRD METER/RANGE/PPM	.9/13/ 1.	.6/13/ 1.	.7/13/ 1.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	24.7/ 3/ .40	32.9/ 3/ .55	77.5/ 3/ 1.42	23.2/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.0/ 3/ .05	3.2/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	2.8/14/ 28.	4.1/14/ 41.	15.6/14/ 156.	3.2/14/ 32.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.4/ 2/ 0.	.1/ 3/ 0.	.4/ 2/ 0.
DILUTION FACTOR	32.91	24.27	9.41	34.89
HC CONCENTRATION PPM	11.	14.	28.	16.
CO CONCENTRATION PPM	27.	21.	27.	52.
CO2 CONCENTRATION PCT	.36	.50	1.37	.33
NOX CONCENTRATION PPM	27.1	40.4	155.5	32.1
HC MASS GRAMS	1.90	2.32	4.87	2.71
CO MASS GRAMS	8.92	6.98	9.18	17.61
CO2 MASS GRAMS	1895.7	2692.9	7476.6	1740.4
NOX MASS GRAMS	14.96	22.58	88.39	17.75
FUEL KG (LB)	.598 (1.32)	.846 (1.86)	2.342 (5.16)	.554 (1.22)
KW HR (HP HR)	1.72 (2.31)	2.60 (3.49)	9.27 (12.43)	1.69 (2.26)
BSHC G/KW HR (G/HP HR)	1.10 (.82)	.89 (.67)	.52 (.39)	1.60 (1.19)
BSCO G/KW HR (G/HP HR)	5.17 (3.86)	2.68 (2.00)	.99 (.74)	10.43 (7.78)
BSCO2 G/KW HR (G/HP HR)	1099.60 (819.97)	1034.31 (771.28)	806.48 (601.39)	1030.57 (768.49)
BSNOX G/KW HR (G/HP HR)	8.68 (6.47)	8.67 (6.47)	9.53 (7.11)	10.51 (7.84)
BSFC KG/KW HR (LB/HP HR)	.347 (.570)	.325 (.534)	.253 (.415)	.328 (.540)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.29 (	20.50)
BSHC G/KW HR (G/HP HR)	.77 (	.58)
BSCO G/KW HR (G/HP HR)	2.79 (	2.08)
BSCO2 G/KW HR (G/HP HR)	903. (	673.)
BSNOX G/KW HR (G/HP HR)	9.40 (	7.01)
BSFC KG/KW HR (LB/HP HR)	.284 (	.467)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.888 (31.36)
MULTIPLIER FOR	G/TEST	1.313
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0859 (.0641)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3026 (.1372)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.31 (2766.1)

TABLE B-16A (CONT'D). TEST D17-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

TEST NO.D17-1 RUN
DATE 5/ 7/80
TIME 09:53
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 60. PCT
ABSOLUTE HUMIDITY 10.7 GM/KG(74.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	802.6 (31.6)	802.6 (31.6)	802.6 (31.6)	802.6 (31.6)
BLOWER INLET P MM. H2O(IN. H2O)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6176.	6261.	6362.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	287.9 (10168.)	291.8 (10308.)	296.5 (10474.)	288.9 (10202.)
HC SAMPLE METER/RANGE/PPM	18.7/11/ 19.	23.1/11/ 23.	36.2/11/ 36.	23.1/11/ 23.
HC BCKGRD METER/RANGE/PPM	9.3/ 1/ 9.	7.6/ 1/ 8.	7.5/ 1/ 8.	7.0/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	50.5/13/ 48.	28.6/13/ 26.	31.7/13/ 29.	58.6/13/ 56.
CO BCKGRD METER/RANGE/PPM	.7/13/ 1.	.7/13/ 1.	.7/13/ 1.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	24.3/ 3/ .40	33.3/ 3/ .55	78.0/ 3/ 1.43	24.2/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .06	2.9/ 3/ .04	3.3/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	3.1/14/ 31.	5.0/14/ 50.	16.1/14/ 161.	3.7/14/ 37.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.5/ 2/ 1.	.2/ 3/ 1.	.4/ 2/ 0.
DILUTION FACTOR	33.34	23.94	9.34	33.38
HC CONCENTRATION PPM	10.	16.	29.	16.
CO CONCENTRATION PPM	46.	24.	27.	54.
CO2 CONCENTRATION PCT	.34	.51	1.38	.35
NOX CONCENTRATION PPM	30.6	49.4	160.9	36.9
HC MASS GRAMS	1.60	2.67	5.04	2.72
CO MASS GRAMS	15.35	8.31	9.29	18.27
CO2 MASS GRAMS	1802.5	2738.4	7511.7	1831.2
NOX MASS GRAMS	16.83	27.60	91.29	20.41
FUEL KG (LB)	.572 (1.26)	.861 (1.90)	2.353 (5.19)	.583 (1.29)
KW HR (HP HR)	1.72 (2.31)	2.81 (3.77)	9.24 (12.38)	1.67 (2.24)
BSHC G/KW HR (G/HP HR)	.93 (.69)	.95 (.71)	.55 (.41)	1.63 (1.21)
BSCO G/KW HR (G/HP HR)	8.90 (6.64)	2.95 (2.20)	1.01 (.75)	10.93 (8.15)
BSCO2 G/KW HR (G/HP HR)	1045.55 (779.67)	972.91 (725.50)	813.35 (606.51)	1095.75 (817.10)
BSNOX G/KW HR (G/HP HR)	9.76 (7.28)	9.81 (7.31)	9.88 (7.37)	12.22 (9.11)
BSFC KG/KW HR (LB/HP HR)	.332 (.545)	.306 (.503)	.255 (.419)	.349 (.574)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.45 (20.71)
BSHC G/KW HR (G/HP HR)	.78 (.58)
BSCO G/KW HR (G/HP HR)	3.32 (2.47)
BSCO2 G/KW HR (G/HP HR)	899. (670.)
BSNOX G/KW HR (G/HP HR)	10.11 (7.54)
BSFC KG/KW HR (LB/HP HR)	.283 (.465)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.901 (31.81)
MULTIPLIER FOR	G/TEST	1.294
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0838 (.0625)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2961 (.1343)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.03 (2755.9)

TABLE B-16B. TEST D17-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

TEST NO.D17-2 RUN
DATE 5/ 9/80
TIME 09:30
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 53. PCT
ABSOLUTE HUMIDITY 10.4 GM/KG(72.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H2O(IN. H2O)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6175.	6260.	6369.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	289.1 (10213.)	293.1 (10353.)	298.2 (10533.)	290.2 (10249.)
HC SAMPLE METER/RANGE/PPM	21.9/11/ 21.	19.9/11/ 19.	32.9/11/ 33.	19.8/11/ 20.
HC BCKGRD METER/RANGE/PPM	5.6/ 1/ 6.	4.6/ 1/ 5.	4.3/ 1/ 4.	4.0/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	29.3/13/ 26.	21.3/13/ 19.	26.9/13/ 24.	52.9/13/ 50.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	23.8/ 3/ .39	32.3/ 3/ .54	76.7/ 3/ 1.40	22.7/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.8/ 3/ .04	3.2/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	2.5/14/ 25.	3.9/14/ 39.	15.8/14/ 158.	3.9/14/ 39.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.7/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	34.23	24.79	9.52	35.77
HC CONCENTRATION PPM	16.	15.	29.	16.
CO CONCENTRATION PPM	26.	18.	23.	49.
CO2 CONCENTRATION PCT	.39	.50	1.36	.32
NOX CONCENTRATION PPM	24.3	38.2	157.4	33.4
HC MASS GRAMS	2.66	2.59	5.00	2.66
CO MASS GRAMS	8.67	6.27	8.01	16.51
CO2 MASS GRAMS	1812.1	2661.2	7419.7	1701.9
NOX MASS GRAMS	13.45	21.42	89.81	18.52
FUEL KG (LB)	.572 (1.26)	.836 (1.84)	2.322 (5.12)	.542 (1.19)
KW HR (HP HR)	1.53 (2.05)	2.55 (3.42)	9.27 (12.43)	1.69 (2.26)
BSHC G/KW HR (G/HP HR)	1.74 (1.30)	1.00 (.74)	.54 (.40)	1.58 (1.17)
BSCO G/KW HR (G/HP HR)	5.66 (4.22)	2.46 (1.83)	.86 (.64)	9.78 (7.29)
BSCO2 G/KW HR (G/HP HR)	1184.00 (882.91)	1043.31 (778.00)	799.80 (596.41)	1007.45 (751.26)
BSNOX G/KW HR (G/HP HR)	8.79 (6.56)	8.40 (6.26)	9.69 (7.22)	10.96 (8.18)
BSFC KG/KW HR (LB/HP HR)	.374 (.615)	.328 (.539)	.251 (.412)	.321 (.527)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.04 (20.17)
BSHC G/KW HR (G/HP HR)	.86 (.64)
BSCO G/KW HR (G/HP HR)	2.62 (1.96)
BSCO2 G/KW HR (G/HP HR)	904. (674.)
BSNOX G/KW HR (G/HP HR)	9.52 (7.10)
BSFC KG/KW HR (LB/HP HR)	.284 (.467)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.868 (30.66)
MULTIPLIER FOR	G/TEST	1.348
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0897 (.0669)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3156 (.1432)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.05 (2792.2)

TABLE B-16B (CONT'D). TEST D17-2 EMISSIONS RESULTS

TABLE ENGINE EMISSION RESULTS
HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

TEST NO.D17-2 RUN
DATE 5/ 9/80
TIME 10110
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 58. PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H2O(IN. H2O)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6176.	6260.	6369.	6197.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	289.0 (10208.)	292.9 (10347.)	298.0 (10527.)	290.0 (10243.)
HC SAMPLE METER/RANGE/PPM	15.8/11/ 16.	20.4/11/ 20.	33.0/11/ 33.	20.1/11/ 20.
HC BCKGRD METER/RANGE/PPM	5.6/ 1/ 6.	5.2/ 1/ 5.	4.8/ 1/ 5.	4.4/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	59.4/13/ 57.	25.3/13/ 23.	27.3/13/ 25.	51.9/13/ 49.
CO BCKGRD METER/RANGE/PPM	.9/13/ 1.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.1/ 3/ .36	28.9/ 3/ .48	75.4/ 3/ 1.37	21.3/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.2/ 3/ .03	2.5/ 3/ .04	2.1/ 3/ .03	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	3.2/14/ 32.	4.7/14/ 47.	15.6/14/ 156.	3.3/14/ 33.
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0.	1.4/ 2/ 1.	.3/ 3/ 1.	1.5/ 2/ 2.
DILUTION FACTOR	36.75	27.90	9.71	38.22
HC CONCENTRATION PPM	10.	15.	29.	16.
CO CONCENTRATION PPM	55.	22.	23.	48.
CO2 CONCENTRATION PCT	.32	.44	1.35	.30
NOX CONCENTRATION PPM	31.7	45.7	155.0	31.5
HC MASS GRAMS	1.73	2.61	4.93	2.65
CO MASS GRAMS	18.48	7.50	8.12	16.14
CO2 MASS GRAMS	1719.1	2356.6	7346.5	1612.2
NOX MASS GRAMS	17.54	25.60	88.37	17.49
FUEL KG (LB)	.547 (1.21)	.742 (1.63)	2.301 (5.07)	.514 (1.13)
KW HR (HP HR)	1.74 (2.34)	2.80 (3.75)	9.25 (12.41)	1.69 (2.26)
BSHC G/KW HR (G/HP HR)	.99 (.74)	.93 (.70)	.53 (.40)	1.57 (1.17)
BSCO G/KW HR (G/HP HR)	10.61 (7.91)	2.68 (2.00)	.88 (.65)	9.56 (7.13)
BSCO2 G/KW HR (G/HP HR)	987.14 (736.11)	842.54 (628.28)	793.95 (592.05)	954.68 (711.91)
BSNOX G/KW HR (G/HP HR)	10.07 (7.51)	9.15 (6.83)	9.55 (7.12)	10.35 (7.72)
BSFC KG/KW HR (LB/HP HR)	.314 (.516)	.265 (.436)	.249 (.409)	.304 (.500)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.48 (20.76)
BSHC G/KW HR (G/HP HR)	.77 (.57)
BSCO G/KW HR (G/HP HR)	3.24 (2.42)
BSCO2 G/KW HR (G/HP HR)	842. (628.)
BSNOX G/KW HR (G/HP HR)	9.62 (7.18)
BSFC KG/KW HR (LB/HP HR)	.265 (.436)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.913 (32.25)
MULTIPLIER FOR	G/TEST	1.281
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0828 (.0617)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3123 (.1416)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.29 (2765.0)

TABLE B-17A. TEST D18-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D18
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.D18-1 RUN
DATE 5/27/80
TIME 9100 — DIESEL EM-408-F
DYNO NO. 5 — BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 46. PCT
ABSOLUTE HUMIDITY 9.3 GM/KG(65.4 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)
BLOWER INLET P MM. H2O(IN. H2O)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	6177.	6259.	6367.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	286.5 (10118.)	290.3 (10258.)	295.3 (10429.)	287.4 (10150.)
HC SAMPLE METER/RANGE/PPM	38.8/11/ 39.	42.0/11/ 42.	40.7/11/ 41.	33.0/11/ 33.
HC BCKGRD METER/RANGE/PPM	18.3/ 1/ 18.	18.9/ 1/ 19.	15.1/ 1/ 15.	12.4/ 1/ 12.
CO SAMPLE METER/RANGE/PPM	52.4/13/ 50.	51.7/13/ 49.	41.0/13/ 38.	27.4/13/ 25.
CO BCKGRD METER/RANGE/PPM	1.3/13/ 1.	1.3/13/ 1.	1.3/13/ 1.	1.5/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	20.9/ 3/ .34	29.9/ 3/ .49	60.5/ 3/ 1.07	19.6/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.3/ 3/ .05	3.6/ 3/ .06	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	2.0/14/ 20.	9.1/14/ 41.	15.5/14/ 155.	2.3/14/ 23.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.6/ 2/ 1.	.1/ 3/ 0.	.1/ 2/ 0.
DILUTION FACTOR	38.76	26.65	12.40	41.80
HC CONCENTRATION PPM	21.	24.	27.	21.
CO CONCENTRATION PPM	48.	47.	36.	23.
CO2 CONCENTRATION PCT	.29	.45	1.02	.27
NOX CONCENTRATION PPM	19.3	40.7	154.6	23.2
HC MASS GRAMS	3.47	3.99	4.57	3.47
CO MASS GRAMS	15.85	15.77	12.22	7.66
CO2 MASS GRAMS	1533.0	2366.7	5527.2	1405.4
NOX MASS GRAMS	10.56	22.60	87.31	12.74
FUEL KG (LB)	.490 (1.08)	.750 (1.65)	1.735 (3.83)	.446 (.98)
KW HR (HP HR)	1.34 (1.79)	2.49 (3.34)	7.69 (10.32)	1.39 (1.86)
BSHC G/KW HR (G/HP HR)	2.60 (1.94)	1.61 (1.20)	.59 (.44)	2.49 (1.86)
BSCO G/KW HR (G/HP HR)	11.85 (8.84)	6.34 (4.73)	1.59 (1.18)	5.51 (4.11)
BSCO2 G/KW HR (G/HP HR)	1146.90 (855.25)	951.45 (709.50)	718.52 (535.80)	1011.21 (754.06)
BSNOX G/KW HR (G/HP HR)	7.90 (5.89)	9.09 (6.78)	11.38 (8.46)	9.17 (6.84)
BSFC KG/KW HR (LB/HP HR)	.366 (.602)	.302 (.496)	.226 (.371)	.321 (.527)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.91 (17.31)
BSHC G/KW HR (G/HP HR)	1.20 (.90)
BSCO G/KW HR (G/HP HR)	3.99 (2.98)
BSCO2 G/KW HR (G/HP HR)	839. (626.)
BSNOX G/KW HR (G/HP HR)	10.32 (7.70)
BSFC KG/KW HR (LB/HP HR)	.265 (.436)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.871 (30.77)
MULTIPLIER FOR	G/TEST	1.331
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1031 (.0769)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3891 (.1765)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	76.99 (2719.1)

TABLE B-17A (CONT'D). TEST D18-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D18
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.D18-1 RUN
DATE 5/27/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 52. PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)
BLOWER INLET P MM. H2O(IN. H2O)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	6176.	6259.	6366.	6196.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	286.3 (10113.)	290.2 (10249.)	295.1 (10424.)	287.2 (10145.)
HC SAMPLE METER/RANGE/PPM	23.1/11/ 23.	34.7/11/ 38.	33.9/11/ 34.	26.8/11/ 27.
HC BCKGRD METER/RANGE/PPM	9.3/ 1/ 9.	9.8/ 1/ 10.	9.7/ 1/ 10.	9.5/ 1/ 10.
CO SAMPLE METER/RANGE/PPM	31.2/13/ 28.	45.3/13/ 42.	39.2/13/ 36.	27.5/13/ 25.
CO BCKGRD METER/RANGE/PPM	2.3/13/ 2.	2.3/13/ 2.	2.3/13/ 2.	2.1/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	19.5/ 3/ .31	28.7/ 3/ .47	63.3/ 3/ 1.13	18.6/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.3/ 3/ .05	3.6/ 3/ .06	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	2.4/14/ 24.	4.6/14/ 46.	16.9/14/ 169.	2.9/14/ 29.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.9/ 2/ 0.	.1/ 3/ 0.	.5/ 2/ 1.
DILUTION FACTOR	42.11	27.91	11.80	44.22
HC CONCENTRATION PPM	14.	25.	25.	18.
CO CONCENTRATION PPM	26.	39.	33.	22.
CO2 CONCENTRATION PCT	.27	.42	1.08	.25
NOX CONCENTRATION PPM	23.3	45.2	168.3	28.1
HC MASS GRAMS	2.31	4.22	4.25	2.90
CO MASS GRAMS	8.58	13.27	11.32	7.51
CO2 MASS GRAMS	1391.2	2252.2	5827.9	1307.5
NOX MASS GRAMS	12.74	25.10	95.00	15.45
FUEL KG (LB)	.441 (.97)	.713 (1.57)	1.828 (4.03)	.415 (.91)
KW HR (HP HR)	1.36 (1.83)	2.47 (3.31)	7.69 (10.32)	1.47 (1.97)
BSHC G/KW HR (G/HP HR)	1.69 (1.26)	1.71 (1.27)	.55 (.41)	1.98 (1.47)
BSCO G/KW HR (G/HP HR)	6.29 (4.69)	5.37 (4.01)	1.47 (1.10)	5.11 (3.81)
BSCO2 G/KW HR (G/HP HR)	1020.52 (761.00)	911.91 (680.01)	757.61 (564.95)	889.77 (663.50)
BSNOX G/KW HR (G/HP HR)	9.34 (6.97)	10.16 (7.58)	12.35 (9.21)	10.51 (7.84)
BSFC KG/KW HR (LB/HP HR)	.323 (.531)	.289 (.475)	.238 (.391)	.282 (.464)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.99 (	17.43)
BSHC G/KW HR (G/HP HR)	1.05 (	.79)
BSCO G/KW HR (G/HP HR)	3.13 (	2.33)
BSCO2 G/KW HR (G/HP HR)	829. (	619.)
BSNOX G/KW HR (G/HP HR)	11.41 (	8.51)
BSFC KG/KW HR (LB/HP HR)	.261 (	.430)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.887 (31.33)
MULTIPLIER FOR	G/TEST	1.307
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1005 (.0750)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3847 (.1745)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	76.57 (2704.6)

TABLE B-17B. TEST D18-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D18
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO. D18-2 RUN
DATE 5/28/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 740.66 MM HG(29.16 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 10.4 GM/KG(73.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	823.0 (32.4)	823.0 (32.4)	823.0 (32.4)	823.0 (32.4)
BLOWER INLET P MM. H2O(IN. H2O)	706.1 (27.8)	706.1 (27.8)	706.1 (27.8)	706.1 (27.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	6175.	6261.	6368.	6198.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	287.4 (10152.)	291.4 (10293.)	296.4 (10469.)	288.5 (10189.)
HC SAMPLE METER/RANGE/PPM	31.9/11/ 32.	36.1/11/ 36.	35.6/11/ 36.	29.1/11/ 29.
HC BCKGRD METER/RANGE/PPM	9.1/ 1/ 9.	9.7/ 1/ 10.	9.2/ 1/ 9.	9.1/ 1/ 9.
CO SAMPLE METER/RANGE/PPM	56.0/13/ 53.	54.9/13/ 52.	43.9/13/ 41.	27.7/13/ 25.
CO BCKGRD METER/RANGE/PPM	1.5/13/ 1.	1.6/13/ 1.	1.6/13/ 1.	2.2/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	20.7/ 3/ .33	29.6/ 3/ .49	62.7/ 3/ 1.12	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.7/ 3/ .04	3.0/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	2.0/14/ 20.	4.0/14/ 40.	15.2/14/ 152.	2.5/14/ 25.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.5/ 2/ 1.	.1/ 3/ 0.	.4/ 2/ 0.
DILUTION FACTOR	39.19	26.95	11.92	45.19
HC CONCENTRATION PPM	23.	27.	27.	20.
CO CONCENTRATION PPM	51.	50.	38.	23.
CO2 CONCENTRATION PCT	.29	.45	1.07	.24
NOX CONCENTRATION PPM	19.7	39.8	152.2	24.3
HC MASS GRAMS	3.81	4.51	4.64	3.36
CO MASS GRAMS	17.04	16.82	13.11	7.57
CO2 MASS GRAMS	1520.1	2395.1	5833.8	1293.4
NOX MASS GRAMS	10.81	22.21	86.31	13.43
FUEL KG (LB)	.486 (1.07)	.760 (1.68)	1.831 (4.04)	.411 (.91)
KW HR (HP HR)	1.28 (1.72)	2.43 (3.26)	7.67 (10.29)	1.39 (1.86)
BSHC G/KW HR (G/HP HR)	2.97 (2.21)	1.85 (1.38)	.60 (.45)	2.42 (1.80)
BSCO G/KW HR (G/HP HR)	13.28 (9.90)	6.91 (5.15)	1.71 (1.27)	5.45 (4.06)
BSCO2 G/KW HR (G/HP HR)	1184.33 (883.15)	983.89 (733.69)	760.18 (566.82)	930.65 (693.98)
BSNOX G/KW HR (G/HP HR)	8.42 (6.28)	9.12 (6.80)	11.25 (8.39)	9.66 (7.21)
BSFC KG/KW HR (LB/HP HR)	.379 (.623)	.312 (.513)	.239 (.392)	.295 (.486)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.78	(17.14)
BSHC G/KW HR (G/HP HR)	1.28	(.95)
BSCO G/KW HR (G/HP HR)	4.27	(3.18)
BSCO2 G/KW HR (G/HP HR)	864.	(644.)
BSNOX G/KW HR (G/HP HR)	10.34	(7.74)
BSFC KG/KW HR (LB/HP HR)	.273	(.449)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.872 (30.80)
MULTIPLIER FOR	G/TEST	1.334
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1044 (.0778)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3825 (.1735)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.65 (2778.0)

TABLE B-17B (CONT'D). TEST D18-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D18-2 RUN 2
DATE 5/28/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

RELATIVE HUMIDITY 60. PCT
ABSOLUTE HUMIDITY 11.4 GM/KG(79.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO. D18
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

BAROMETER 739.90 MM HG(29.13 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	797.6 (31.4)	797.6 (31.4)	797.6 (31.4)	797.6 (31.4)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6175.	6259.	6366.	6196.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	287.7 (10161.)	291.6 (10299.)	296.6 (10475.)	288.7 (10195.)
HC SAMPLE METER/RANGE/PPM	24.5/11/ 25.	37.5/11/ 38.	36.5/11/ 37.	29.1/11/ 29.
HC BCKGRD METER/RANGE/PPM	12.9/ 1/ 13.	11.7/ 1/ 12.	12.0/ 1/ 12.	11.8/ 1/ 12.
CO SAMPLE METER/RANGE/PPM	29.9/13/ 27.	42.7/13/ 40.	36.1/13/ 33.	30.9/13/ 28.
CO BCKGRD METER/RANGE/PPM	.9/13/ 1.	.7/13/ 1.	.9/13/ 1.	5.6/13/ 5.
CO2 SAMPLE METER/RANGE/PCT	18.8/ 3/ .30	27.9/ 3/ .46	60.8/ 3/ 1.08	19.3/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.9/ 3/ .04	2.7/ 3/ .04	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	2.3/14/ 23.	4.4/14/ 44.	16.5/14/ 165.	2.6/14/ 26.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.6/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	43.73	28.75	12.34	42.49
HC CONCENTRATION PPM	12.	26.	26.	18.
CO CONCENTRATION PPM	26.	38.	31.	22.
CO2 CONCENTRATION PCT	.26	.42	1.04	.26
NOX CONCENTRATION PPM	22.2	43.1	165.0	25.6
HC MASS GRAMS	1.98	4.41	4.36	2.93
CO MASS GRAMS	8.58	12.88	10.71	7.45
CO2 MASS GRAMS	1390.8	2219.3	5653.5	1400.6
NOX MASS GRAMS	12.21	24.04	93.59	14.13
FUEL KG (LB)	.440 (.97)	.703 (1.55)	1.774 (3.91)	.444 (.98)
KW HR (HP HR)	1.43 (1.91)	2.46 (3.30)	7.66 (10.27)	1.50 (2.01)
BSHC G/KW HR (G/HP HR)	1.39 (1.03)	1.79 (1.34)	.57 (.43)	1.96 (1.46)
BSCO G/KW HR (G/HP HR)	6.02 (4.49)	5.23 (3.90)	1.40 (1.04)	4.98 (3.71)
BSCO2 G/KW HR (G/HP HR)	975.89 (727.72)	901.82 (672.49)	738.34 (550.58)	936.19 (698.12)
BSNOX G/KW HR (G/HP HR)	8.56 (6.39)	9.77 (7.28)	12.22 (9.11)	9.45 (7.04)
BSFC KG/KW HR (LB/HP HR)	.309 (.508)	.286 (.470)	.232 (.381)	.296 (.487)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	13.04	(17.49)
BSHC G/KW HR (G/HP HR)	1.05	(.78)
BSCO G/KW HR (G/HP HR)	3.04	(2.27)
BSCO2 G/KW HR (G/HP HR)	818.	(610.)
BSNOX G/KW HR (G/HP HR)	11.04	(8.23)
BSFC KG/KW HR (LB/HP HR)	.258	(.424)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.874	(30.86)
MULTIPLIER FOR	G/TEST	1.333	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1022	(.0762)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3967	(.1799)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.18 (2761.2)

TABLE B-18A. TEST D19-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D19
ENGINE MODEL 79 IHC DTI 466
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.19-3 RUN 1
DATE 8/ 8/80
TIME
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 58. PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.5 GRAINS/LB) NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)
BLOWER INLET P MM. H2O(IN. H2O)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3362.	3369.	3428.	3336.
TIME SECONDS	299.9	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	159.0 (5615.)	159.3 (5627.)	162.1 (5726.)	157.8 (5572.)
HC SAMPLE METER/RANGE/PPM	8.1/22/ 41.	7.2/22/ 36.	8.1/22/ 41.	5.9/22/ 29.
HC BCKGRD METER/RANGE/PPM	8.5/ 1/ 9.	8.7/ 1/ 9.	8.4/ 1/ 8.	8.0/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	64.8/13/ 63.	39.2/13/ 36.	32.7/13/ 30.	25.0/13/ 22.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.2/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	29.4/ 3/ .48	39.3/ 3/ .66	82.2/ 3/ 1.52	20.1/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	3.1/ 3/ .05	3.0/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	4.1/14/ 41.	5.7/14/ 57.	14.5/14/ 145.	2.8/14/ 28.
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1.	1.1/ 2/ 1.	.4/ 3/ 1.	2.0/ 2/ 2.
DILUTION FACTOR	27.06	19.95	8.80	40.80
HC CONCENTRATION PPM	32.	28.	33.	22.
CO CONCENTRATION PPM	61.	35.	28.	22.
CO2 CONCENTRATION PCT	.44	.62	1.47	.28
NOX CONCENTRATION PPM	39.9	56.1	144.4	25.7
HC MASS GRAMS	2.97	2.53	3.10	1.96
CO MASS GRAMS	11.32	6.48	5.33	3.98
CO2 MASS GRAMS	1291.9	1808.1	4378.3	800.4
NOX MASS GRAMS	12.15	17.10	44.77	7.75
FUEL KG (LB)	.412 (.91)	.570 (1.26)	1.372 (3.02)	.254 (.56)
KW HR (HP HR)	.91 (1.22)	1.70 (2.28)	5.75 (7.70)	1.01 (1.35)
BSHC G/KW HR (G/HP HR)	3.26 (2.43)	1.49 (1.11)	.54 (.40)	1.94 (1.45)
BSCO G/KW HR (G/HP HR)	12.41 (9.25)	3.81 (2.84)	.93 (.69)	3.95 (2.94)
BSCO2 G/KW HR (G/HP HR)	1416.88 (1056.57)	1063.82 (793.29)	762.11 (568.30)	793.19 (591.48)
BSNOX G/KW HR (G/HP HR)	13.32 (9.94)	10.06 (7.50)	7.79 (5.81)	7.68 (5.73)
BSFC KG/KW HR (LB/HP HR)	.451 (.742)	.335 (.551)	.239 (.393)	.251 (.413)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.37 (12.56)
BSHC G/KW HR (G/HP HR)	1.13 (.84)
BSCO G/KW HR (G/HP HR)	2.89 (2.16)
BSCO2 G/KW HR (G/HP HR)	884. (659.)
BSNOX G/KW HR (G/HP HR)	8.73 (6.51)
BSFC KG/KW HR (LB/HP HR)	.278 (.458)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.893 (31.54)
MULTIPLIER FOR	G/TEST	.715
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0763 (.0569)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2741 (.1243)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-18A (CONT'D). TEST D19-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D19
ENGINE MODEL 79 IHC DTI 466
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.19-3 RUN 1
DATE 8/ 8/80
TIME
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 58. PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)
BLOWER INLET P MM. H2O(IN. H2O)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3325.	3369.	3427.	3336.
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	157.3 (5554.)	159.3 (5628.)	162.1 (5725.)	157.8 (5573.)
HC SAMPLE METER/RANGE/PPM	20.3/11/ 20.	27.2/11/ 27.	38.2/11/ 38.	29.5/11/ 30.
HC BCKGRD METER/RANGE/PPM	8.0/ 1/ 8.	8.1/ 1/ 8.	6.8/ 1/ 7.	7.4/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	30.3/13/ 27.	30.2/13/ 27.	32.0/13/ 29.	23.3/13/ 21.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.2/13/ 0.	.1/13/ 0.	.2/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	24.3/ 3/ .40	34.2/ 3/ .57	81.5/ 3/ 1.50	20.9/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	3.1/14/ 31.	4.5/14/ 45.	13.8/14/ 138.	2.3/14/ 23.
NOX BCKGRD METER/RANGE/PPM	1.6/ 2/ 2.	1.5/ 2/ 2.	.4/ 3/ 1.	1.4/ 2/ 1.
DILUTION FACTOR	33.49	23.24	8.89	39.19
HC CONCENTRATION PPM	13.	19.	32.	22.
CO CONCENTRATION PPM	27.	26.	28.	20.
CO2 CONCENTRATION PCT	.35	.53	1.46	.29
NOX CONCENTRATION PPM	29.1	43.2	137.3	21.4
HC MASS GRAMS	1.14	1.79	3.01	2.03
CO MASS GRAMS	4.88	4.89	5.21	3.70
CO2 MASS GRAMS	997.6	1547.2	4338.1	848.7
NOX MASS GRAMS	8.75	13.17	42.56	6.47
FUEL KG (LB)	.315 (.69)	.487 (1.07)	1.359 (3.00)	.269 (.59)
KW HR (HP HR)	.96 (1.28)	1.71 (2.29)	5.75 (7.72)	1.00 (1.34)
BSHC G/KW HR (G/HP HR)	1.19 (.89)	1.04 (.78)	.52 (.39)	2.03 (1.51)
BSCO G/KW HR (G/HP HR)	5.10 (3.80)	2.86 (2.13)	.91 (.68)	3.70 (2.76)
BSCO2 G/KW HR (G/HP HR)	1043.50 (778.14)	905.60 (675.31)	753.94 (562.21)	848.47 (632.70)
BSNOX G/KW HR (G/HP HR)	9.16 (6.83)	7.71 (5.75)	7.40 (5.52)	6.47 (4.82)
BSFC KG/KW HR (LB/HP HR)	.329 (.541)	.285 (.469)	.236 (.388)	.269 (.442)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.42 (12.63)
BSHC G/KW HR (G/HP HR)	.85 (.63)
BSCO G/KW HR (G/HP HR)	1.98 (1.48)
BSCO2 G/KW HR (G/HP HR)	821. (612.)
BSNOX G/KW HR (G/HP HR)	7.53 (5.62)
BSFC KG/KW HR (LB/HP HR)	.258 (.424)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.950 (33.55)
MULTIPLIER FOR	G/TEST	.670
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0711 (.0530)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2758 (.1251)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-19A. TEST D22-1 EMISSIONS RESULTS
C-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-1 RUN1
DATE 1/26/81
TIME 9:28
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 61. PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.0 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)
BLOWER INLET P MM. H2O(IN. H2O)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6264.	6371.	6202.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	300.5 (10615.)	304.6 (10757.)	309.8 (10941.)	301.5 (10651.)
HC SAMPLE METER/RANGE/PPM	17.7/23/ 88.	10.8/23/ 54.	10.5/23/ 53.	6.3/23/ 32.
HC BCKGRD METER/RANGE/PPM	9.5/ 2/ 10.	9.2/ 2/ 9.	9.4/ 2/ 9.	9.0/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	57.2/13/ 55.	64.7/13/ 62.	55.4/12/ 120.	25.6/13/ 23.
CO BCKGRD METER/RANGE/PPM	.6/13/ 1.	.5/13/ 0.	.2/12/ 0.	.3/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.6/ 3/ .37	28.4/ 3/ .47	57.1/ 3/ 1.01	18.1/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.7/ 3/ .04	2.6/ 3/ .04	2.3/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.8/13/ 29.	4.0/14/ 40.	8.6/14/ 86.	3.0/14/ 30.
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0.	.3/ 2/ 0.	.5/ 2/ 1.	.4/ 2/ 0.
DILUTION FACTOR	35.24	27.99	13.11	45.43
HC CONCENTRATION PPM	79.	45.	44.	23.
CO CONCENTRATION PPM	53.	60.	115.	23.
CO2 CONCENTRATION PCT	.32	.43	.97	.26
NOX CONCENTRATION PPM	29.0	40.0	85.5	29.7
HC MASS GRAMS	13.71	7.89	7.85	3.95
CO MASS GRAMS	18.40	21.36	41.31	7.93
CO2 MASS GRAMS	1777.5	2384.1	5496.2	1409.2
NOX MASS GRAMS	16.70	23.32	50.64	17.12
FUEL KG (LB)	.577 (1.27)	.762 (1.68)	1.743 (3.84)	.448 (.99)
KW HR (HP HR)	1.32 (1.77)	2.12 (2.84)	6.33 (8.49)	1.37 (1.84)
BSHC G/KW HR (G/HP HR)	10.37 (7.73)	3.72 (2.77)	1.24 (.92)	2.88 (2.15)
BSCO G/KW HR (G/HP HR)	13.92 (10.38)	10.08 (7.51)	6.52 (4.86)	5.78 (4.31)
BSCO2 G/KW HR (G/HP HR)	1344.74 (1002.78)	1124.65 (838.65)	867.63 (646.99)	1027.37 (766.11)
BSNOX G/KW HR (G/HP HR)	12.63 (9.42)	11.00 (8.20)	7.99 (5.96)	12.48 (9.31)
BSFC KG/KW HR (LB/HP HR)	.437 (.718)	.360 (.591)	.275 (.452)	.326 (.536)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.15 (14.95)
BSHC G/KW HR (G/HP HR)	3.00 (2.23)
BSCO G/KW HR (G/HP HR)	7.98 (5.95)
BSCO2 G/KW HR (G/HP HR)	993. (740.)
BSNOX G/KW HR (G/HP HR)	9.67 (7.21)
BSFC KG/KW HR (LB/HP HR)	.317 (.521)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.954 (33.69)
MULTIPLIER FOR	G/TEST	1.275
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1144 (.0853)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3613 (.1639)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.41 (2875.6)

TABLE B-19A (CONT'D). TEST D22-1 EMISSIONS RESULTS

H-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-1 RUN1
DATE 1/26/81
TIME 10:18
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 11.2 GM/KG(78.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)
BLOWER INLET P MM. H2O(IN. H2O)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6264.	6370.	6202.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	300.4 (10611.)	304.5 (10754.)	309.6 (10936.)	301.5 (10647.)
HC SAMPLE METER/RANGE/PPM	7.6/23/ 38.	10.3/23/ 51.	9.2/23/ 46.	5.9/23/ 29.
HC BCKGRD METER/RANGE/PPM	8.5/ 2/ 9.	8.6/ 2/ 9.	8.7/ 2/ 9.	8.7/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	29.8/13/ 27.	57.3/13/ 55.	98.1/13/ 100.	24.5/13/ 22.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	18.3/ 3/ .29	24.7/ 3/ .40	53.5/ 3/ .93	16.8/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.1/ 3/ .03	2.1/ 3/ .03	1.9/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	10.0/13/ 30.	13.3/13/ 40.	31.3/13/ 94.	11.7/13/ 35.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.7/ 2/ 1.	1.0/ 2/ 1.	.9/ 2/ 1.
DILUTION FACTOR	44.76	32.46	14.12	49.11
HC CONCENTRATION PPM	30.	43.	38.	21.
CO CONCENTRATION PPM	27.	53.	96.	22.
CO2 CONCENTRATION PCT	.26	.37	.91	.24
NOX CONCENTRATION PPM	29.6	39.2	92.8	34.2
HC MASS GRAMS	5.18	7.56	6.78	3.62
CO MASS GRAMS	9.33	18.85	34.71	7.65
CO2 MASS GRAMS	1414.3	2070.4	5132.7	1321.4
NOX MASS GRAMS	17.00	22.84	54.99	19.71
FUEL KG (LB)	.451 (.99)	.663 (1.46)	1.625 (3.58)	.420 (.93)
KW HR (HP HR)	1.36 (1.82)	2.17 (2.91)	6.33 (8.49)	1.36 (1.82)
BSHC G/KW HR (G/HP HR)	3.81 (2.84)	3.48 (2.60)	1.07 (.80)	2.66 (1.99)
BSCO G/KW HR (G/HP HR)	6.86 (5.12)	8.69 (6.48)	5.48 (4.09)	5.63 (4.20)
BSCO2 G/KW HR (G/HP HR)	1040.54 (775.93)	954.21 (711.56)	810.25 (604.20)	972.21 (724.98)
BSNOX G/KW HR (G/HP HR)	12.51 (9.33)	10.52 (7.85)	8.68 (6.47)	14.50 (10.81)
BSFC KG/KW HR (LB/HP HR)	.332 (.546)	.305 (.502)	.257 (.422)	.309 (.508)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.22 (15.05)
BSHC G/KW HR (G/HP HR)	2.06 (1.54)
BSCO G/KW HR (G/HP HR)	6.29 (4.69)
BSCO2 G/KW HR (G/HP HR)	886. (660.)
BSNOX G/KW HR (G/HP HR)	10.20 (7.61)
BSFC KG/KW HR (LB/HP HR)	.281 (.463)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.910 (32.16)
MULTIPLIER FOR	G/TEST	1.336
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1190 (.0887)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4228 (.1918)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	81.07 (2863.4)

TABLE B-19B. TEST D22-2 EMISSIONS RESULTS

C-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-2 RUN1
DATE 1/27/81
TIME 9:45
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 57. PCT
ABSOLUTE HUMIDITY 10.2 GM/KG(71.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)
BLOWER INLET P MM. H2O(IN. H2O)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179.	6264.	6369.	6202.
TIME SECONDS	295.9	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.4 (10577.)	303.6 (10722.)	308.7 (10902.)	300.6 (10616.)
HC SAMPLE METER/RANGE/PPM	17.9/23/ 90.	10.4/23/ 52.	10.1/23/ 50.	6.0/23/ 30.
HC BCKGRD METER/RANGE/PPM	8.3/ 2/ 8.	9.5/ 2/ 10.	10.0/ 2/ 10.	9.3/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	46.7/13/ 44.	69.7/13/ 68.	61.8/12/ 136.	27.3/13/ 25.
CO BCKGRD METER/RANGE/PPM	1.6/13/ 1.	1.4/13/ 1.	.1/12/ 0.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	19.5/ 3/ .31	28.0/ 3/ .46	57.4/ 3/ 1.01	18.8/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.3/ 3/ .04	3.1/ 3/ .05	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	16.2/13/ 48.	16.8/13/ 51.	32.1/13/ 96.	11.8/13/ 35.
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0.	.4/ 2/ 0.	.7/ 2/ 1.	.9/ 2/ 1.
DILUTION FACTOR	41.06	28.39	13.01	43.68
HC CONCENTRATION PPM	81.	43.	41.	21.
CO CONCENTRATION PPM	41.	65.	131.	24.
CO2 CONCENTRATION PCT	.27	.43	.97	.26
NOX CONCENTRATION PPM	48.2	50.2	95.7	34.6
HC MASS GRAMS	14.07	7.47	7.31	3.64
CO MASS GRAMS	14.44	22.90	47.10	8.39
CO2 MASS GRAMS	1496.5	2370.0	5469.8	1420.0
NOX MASS GRAMS	27.60	29.13	56.49	19.90
FUEL KG (LB)	.488 (1.08)	.758 (1.67)	1.737 (3.83)	.451 (.99)
KW HR (HP HR)	1.37 (1.84)	2.21 (2.96)	6.47 (8.68)	1.41 (1.89)
BSHC G/KW HR (G/HP HR)	10.26 (7.65)	3.39 (2.52)	1.13 (.84)	2.58 (1.92)
BSCO G/KW HR (G/HP HR)	10.52 (7.85)	10.37 (7.74)	7.28 (5.43)	5.96 (4.44)
BSCO2 G/KW HR (G/HP HR)	1090.97 (813.54)	1073.76 (800.70)	845.17 (630.24)	1007.73 (751.46)
BSNOX G/KW HR (G/HP HR)	20.12 (15.00)	13.20 (9.84)	8.73 (6.51)	14.12 (10.53)
BSFC KG/KW HR (LB/HP HR)	.356 (.585)	.343 (.565)	.268 (.441)	.320 (.526)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.46 (15.37)
BSHC G/KW HR (G/HP HR)	2.83 (2.11)
BSCO G/KW HR (G/HP HR)	8.10 (6.04)
BSCO2 G/KW HR (G/HP HR)	939. (700.)
BSNOX G/KW HR (G/HP HR)	11.62 (8.66)
BSFC KG/KW HR (LB/HP HR)	.300 (.493)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.890 (31.42)
MULTIPLIER FOR	G/TEST	1.363
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1189 (.0887)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3969 (.1800)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.79 (2853.7)

TABLE B-19B. TEST D22-2 EMISSIONS RESULTS

H-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-2 RUN1
DATE 1/27/81
TIME 10:25
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)
BLOWER INLET P MM. H2O(IN. H2O)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6264.	6369.	6201.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.3 (10570.)	303.3 (10712.)	308.4 (10891.)	300.2 (10604.)
HC SAMPLE METER/RANGE/PPM	10.1/23/ 50.	10.8/23/ 54.	9.3/23/ 47.	6.3/23/ 32.
HC BCKGRD METER/RANGE/PPM	8.7/ 2/ 9.	9.0/ 2/ 9.	8.9/ 2/ 9.	8.5/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	34.2/13/ 32.	61.2/13/ 59.	52.8/12/ 113.	26.9/13/ 25.
CO BCKGRD METER/RANGE/PPM	.5/13/ 0.	.2/13/ 0.	.3/12/ 1.	.8/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	18.4/ 3/ .29	25.9/ 3/ .42	55.6/ 3/ .98	18.4/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.2/ 3/ .03	2.6/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	12.6/13/ 38.	16.0/13/ 48.	34.9/13/ 105.	13.2/13/ 40.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.5/ 2/ 1.	.8/ 2/ 1.	.5/ 2/ 1.
DILUTION FACTOR	44.27	30.85	13.51	44.65
HC CONCENTRATION PPM	42.	45.	38.	23.
CO CONCENTRATION PPM	30.	57.	108.	23.
CO2 CONCENTRATION PCT	.26	.39	.94	.25
NOX CONCENTRATION PPM	37.1	47.5	103.9	39.2
HC MASS GRAMS	7.22	7.92	6.81	4.02
CO MASS GRAMS	10.60	20.15	38.88	8.17
CO2 MASS GRAMS	1426.3	2170.5	5304.1	1397.8
NOX MASS GRAMS	21.22	27.54	61.30	22.52
FUEL KG (LB)	.457 (1.01)	.695 (1.53)	1.681 (3.71)	.444 (.98)
KW HR (HP HR)	1.38 (1.86)	2.21 (2.96)	6.45 (8.65)	1.37 (1.84)
BSHC G/KW HR (G/HP HR)	5.22 (3.89)	3.59 (2.68)	1.06 (.79)	2.93 (2.18)
BSCO G/KW HR (G/HP HR)	7.66 (5.71)	9.13 (6.81)	6.03 (4.50)	5.96 (4.44)
BSCO2 G/KW HR (G/HP HR)	1030.44 (768.40)	983.38 (733.30)	822.73 (613.51)	1019.01 (759.88)
BSNOX G/KW HR (G/HP HR)	15.33 (11.43)	12.48 (9.30)	9.51 (7.09)	16.42 (12.25)
BSFC KG/KW HR (LB/HP HR)	.330 (.543)	.315 (.518)	.261 (.429)	.324 (.532)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.41 (15.30)	
BSHC G/KW HR (G/HP HR)	2.28 (1.70)	
BSCO G/KW HR (G/HP HR)	6.32 (5.08)	
BSCO2 G/KW HR (G/HP HR)	903. (673.)	
BSNOX G/KW HR (G/HP HR)	11.62 (8.67)	
BSFC KG/KW HR (LB/HP HR)	.287 (.472)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	.915 (32.33)	
MULTIPLIER FOR	G/TEST	1.323	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1160 (.0865)	
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4037 (.1831)	
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	79.71 (2815.4)	

APPENDIX C

BAGGED NO_X VALUES FROM BASELINE TEST RESULTS

Engines 9-22

Table Number	Engine Number	Description
C-1	D-9	1979 Mack ETAZ
C-2	D-10	1980 Mack ETSX
C-3	D-11	1979 Cummins VTB-903
C-4	D-12	1979 Cat. 3406 DITA
C-5	D-13	1979 Cat. 3406 PCTA
C-6	D-14	1979 Cummins B. C. NTC-350
C-7	D-15	1979 IH DT-466
C-8	D-16	1979 DDA 6V-92TA (90mm)
C-9	D-17	1979 DDA 8V-71TA
C-10	D-18	1979 Cummins NTC-290
C-11	D-19	1979 IH DTI-466B (same as D-7)
C-12	D-22	1979 Cummins NH-250

TABLE C-1A. TEST D9-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5099-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 8.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D9-2 RUN
DATE 12/19/79
TIME 1010S
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 751.59 MM HG(29.59 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 59 PCT
ABSOLUTE HUMIDITY 9.8 GM/KG(68.3 GRAINS/LB)

NOX HUMIDITY C.F. .9699

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H2O(IN. H2O)	548.6 (21.6)	548.6 (21.6)	548.6 (21.6)	548.6 (21.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6269	6370	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	302.2 (10674)	306.2 (10816)	311.9 (10999)	303.2 (10710)
HC SAMPLE METER/RANGE/PPM	26.9/11/ 26	25.9/11/ 26	36.6/11/ 37	21.5/11/ 21
HC BCKGRD METER/RANGE/PPM	5.1/ 1/ 5	5.4/ 1/ 5	5.5/ 1/ 6	5.1/ 1/ 5
CO SAMPLE METER/RANGE/PPM	81.1/13/ 81	91.8/13/ 93	38.8/13/ 36	24.1/13/ 22
CO BCKGRD METER/RANGE/PPM	2.2/13/ 2	1.8/13/ 2	1.2/13/ 1	1.1/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.4/ 3/ .35	29.9/ 3/ .49	65.7/ 3/ 1.18	19.3/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.8/ 3/ .06	3.0/ 3/ .05	3.1/ 3/ .05	3.6/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	30.4/ 2/ 30	37.2/ 2/ 37	32.6/ 3/ 98	31.9/ 2/ 32
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	.8/ 2/ 1	.2/ 3/ 1	1.0/ 2/ 1
DILUTION FACTOR	37.64	26.51	11.32	42.67
HC CONCENTRATION PPM	21	21	32	16
CO CONCENTRATION PPM	77	89	33	20
CO2 CONCENTRATION PCT	.29	.45	1.13	.26
NOX CONCENTRATION PPM	29.2	36.9	97.3	30.9
HC MASS GRAMS	3.73	3.65	5.68	2.89
CO MASS GRAMS	27.20	31.71	12.10	7.11
CO2 MASS GRAMS	1598.0	2521.8	6965.8	1920.9
NOX MASS GRAMS	16.38	20.69	56.16	17.39
FUEL KG (LB)	.521 (1.15)	.814 (1.80)	2.050 (4.52)	.459 (1.00)
KW HR (HP HR)	4.62 (2.17)	2.76 (3.70)	8.76 (11.75)	1.72 (2.31)
BSHC G/KW HR (G/HP HR)	2.31 (1.72)	1.32 (.99)	.65 (.48)	1.67 (1.25)
BSCO G/KW HR (G/HP HR)	16.81 (12.53)	11.48 (8.56)	1.38 (1.03)	4.13 (3.08)
BSCO2 G/KW HR (G/HP HR)	987.42 (736.32)	913.10 (680.90)	738.06 (550.37)	829.23 (619.63)
BSNOX G/KW HR (G/HP HR)	10.12 (7.55)	7.49 (5.59)	6.91 (4.78)	10.09 (7.52)
BSFC KG/KW HR (LB/HP HR)	.322 (.529)	.295 (.485)	.234 (.385)	.264 (.433)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.86 (19.93)	
BSHC G/KW HR (G/HP HR)	1.07 (.80)	
BSCO G/KW HR (G/HP HR)	5.26 (3.92)	
BSCO2 G/KW HR (G/HP HR)	808 (602)	
BSNOX G/KW HR (G/HP HR)	7.44 (5.55)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.258 (.425)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.837 (29.57)
MULTIPLIER FOR	G/TEST	1.961
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0983 (.0733)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3805 (.1726)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	85.10 (3005.7)

TABLE C-1A (CONT'D). TEST D9-2 EMISSIONS RESULTS

HOT TRANSIENT 2 — PROJECT NO. 11-5099-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 8.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D9-3 RUN 2
DATE 12/17/79
TIME 2127
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 755.65 MM HG(29.75 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 9.5 GM/KG(66.3 GRAINS/LB)

NOX HUMIDITY C.F. .9607

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H2O(IN. H2O)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6265	6371	6202
TIME SECONDS	296.1	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	309.8 (10765)	308.8 (10908)	314.0 (11092)	305.7 (10798)
HC SAMPLE METER/RANGE/PPM	21.6/11/ 22	25.9/11/ 26	39.0/11/ 39	25.3/11/ 25
HC BCKGRD METER/RANGE/PPM	5.3/ 1/ 5	5.5/ 1/ 6	5.5/ 1/ 6	6.0/ 1/ 6
CO SAMPLE METER/RANGE/PPM	27.0/13/ 29	19.8/13/ 13	38.3/13/ 35	25.7/13/ 23
CO BCKGRD METER/RANGE/PPM	3.0/13/ 3	3.9/13/ 3	9.1/13/ 9	9.3/13/ 9
CO2 SAMPLE METER/RANGE/PCT	19.6/ 3/ .31	27.7/ 3/ .95	63.0/ 3/ 1.12	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.0/ 3/ .05	3.0/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	25.8/ 2/ 26	39.7/ 2/ 35	98.5/ 2/ 98	18.0/ 2/ 18
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.6/ 2/ 1	.9/ 2/ 0	.9/ 2/ 0
DILUTION FACTOR	41.96	29.21	11.86	45.27
HC CONCENTRATION PPM	16	21	39	19
CO CONCENTRATION PPM	21	10	31	19
CO2 CONCENTRATION PCT	.26	.91	1.08	.25
NOX CONCENTRATION PPM	25.6	39.1	98.1	17.6
HC MASS GRAMS	2.89	3.66	6.16	3.93
CO MASS GRAMS	7.59	3.56	11.22	6.75
CO2 MASS GRAMS	1965.1	2321.9	6215.8	1379.1
NOX MASS GRAMS	19.39	19.39	56.69	9.89
FUEL KG (LB)	.968 (1.03)	.737 (1.63)	1.971 (4.35)	.992 (.97)
KW HR (HP HR)	1.67 (2.24)	2.73 (3.66)	8.85 (11.87)	1.60 (2.15)
BSHC G/KW HR (G/HP HR)	1.73 (1.29)	1.34 (1.00)	.70 (.52)	2.14 (1.60)
BSCO G/KW HR (G/HP HR)	4.51 (3.36)	1.31 (.97)	1.27 (.95)	4.22 (3.14)
BSCO2 G/KW HR (G/HP HR)	876.68 (653.79)	851.56 (635.01)	702.47 (523.83)	861.99 (642.91)
BSNOX G/KW HR (G/HP HR)	8.58 (6.40)	7.10 (5.30)	6.90 (4.77)	6.18 (4.61)
BSFC KG/KW HR (LB/HP HR)	.280 (.461)	.270 (.445)	.223 (.366)	.276 (.453)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.85 (19.91)	
BSHC G/KW HR (G/HP HR)	1.09 (.81)	
BSCO G/KW HR (G/HP HR)	1.96 (1.46)	
BSCO2 G/KW HR (G/HP HR)	767 (572)	
BSNOX G/KW HR (G/HP HR)	6.75 (5.03)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.299 (.491)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.890 (31.45)
MULTIPLIER FOR	G/TEST	1.385
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0933 (.0696)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3828 (.1736)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	85.86 (3032.6)

TABLE C-1B. TEST D9-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5099-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D9-3 RUN
DATE 12/17/79
TIME 1107
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 755.90 MM HG(29.79 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.1 GRAINS/LB)

NOX HUMIDITY C.F. .9513

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H20(IN. H20)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6269	6371	6202
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	304.6 (10757)	308.6 (10899)	313.9 (11086)	305.5 (10792)
HC SAMPLE METER/RANGE/PPM	23.9/11/ 23	25.7/11/ 26	38.6/11/ 39	23.7/11/ 24
HC BCKGRD METER/RANGE/PPM	5.9/ 1/ 6	6.2/ 1/ 6	6.8/ 1/ 7	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	34.6/13/ 32	38.6/13/ 36	98.1/13/ 95	34.9/13/ 31
CO BCKGRD METER/RANGE/PPM	9.8/13/ 9	7.9/13/ 7	14.3/13/ 13	14.5/13/ 13
CO2 SAMPLE METER/RANGE/PCT	20.7/ 3/ .33	29.9/ 3/ .98	66.7/ 3/ 1.20	14.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	3.6/ 3/ .06	3.9/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	30.8/ 2/ 31	37.9/ 2/ 37	34.8/ 3/ 104	30.3/ 2/ 30
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.8/ 2/ 1	.3/ 3/ 1	1.2/ 2/ 1
DILUTION FACTOR	39.53	27.29	11.12	42.97
HC CONCENTRATION PPM	18	20	32	17
CO CONCENTRATION PPM	27	28	32	18
CO2 CONCENTRATION PCT	.29	.99	1.15	.26
NOX CONCENTRATION PPM	30.1	36.6	103.6	29.1
HC MASS GRAMS	3.11	3.51	5.86	2.98
CO MASS GRAMS	9.52	10.09	11.73	6.55
CO2 MASS GRAMS	1610.7	2499.3	6593.0	1929.7
NOX MASS GRAMS	16.69	20.57	59.16	16.20
FUEL KG (LB)	.516 (1.14)	.796 (1.76)	2.090 (4.61)	.457 (1.01)
KW HR (HP HR)	1.51 (2.03)	2.67 (3.59)	8.87 (11.89)	1.62 (2.17)
BSHC G/KW HR (G/HP HR)	2.05 (1.53)	1.31 (.98)	.66 (.49)	1.89 (1.37)
BSCO G/KW HR (G/HP HR)	6.30 (4.69)	3.77 (2.81)	1.32 (.99)	4.05 (3.02)
BSCO2 G/KW HR (G/HP HR)	1069.68 (793.93)	939.69 (697.00)	743.62 (554.51)	883.39 (658.75)
BSNOX G/KW HR (G/HP HR)	11.03 (8.23)	7.69 (5.74)	6.67 (4.98)	10.01 (7.46)
BSFC KG/KW HR (LB/HP HR)	.341 (.560)	.298 (.490)	.236 (.388)	.282 (.464)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.872 (30.81)
MULTIPLIER FOR	G/TEST	1.913
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0963 (.0718)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3661 (.1661)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	85.56 (3022.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.67 (19.67)	
BSHC G/KW HR (G/HP HR)	1.05 (.79)	
BSCO G/KW HR (G/HP HR)	2.58 (1.93)	
BSCO2 G/KW HR (G/HP HR)	827 (617)	
BSNOX G/KW HR (G/HP HR)	7.68 (5.72)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.263 (.432)	

TABLE C-1B (CONT'D). TEST D9-3 EMISSIONS RESULTS

HOT TRANSIENT 1

PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 79 MACK ETAZ
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D9-3 RUN 1
DATE 12/17/79
TIME 1147
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 755.90 MM HG(29.74 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 50 PCT
ABSOLUTE HUMIDITY 9.0 GM/KG(62.8 GRAINS/LB)

NOX HUMIDITY C.F. .9959

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)	543.6 (21.4)
BLOWER INLET P MM. H2O(IN. H2O)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)	525.8 (20.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6264	6371	6202
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	309.3 (10948)	308.3 (10890)	313.6 (11076)	305.3 (10783)
HC SAMPLE METER/RANGE/PPM	20.3/11/ 20	24.8/11/ 25	39.1/11/ 39	24.7/11/ 25
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5	5.7/ 1/ 6	5.7/ 1/ 6	5.2/ 1/ 5
CO SAMPLE METER/RANGE/PPM	30.9/13/ 28	32.8/13/ 30	40.9/13/ 38	27.2/13/ 24
CO BCKGRD METER/RANGE/PPM	5.9/13/ 5	8.6/13/ 8	7.8/13/ 7	5.9/13/ 5
CO2 SAMPLE METER/RANGE/PCT	20.9/ 3/ .33	26.8/ 3/ .44	69.9/ 3/ 1.15	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	2.9/ 3/ .04	5.9/ 3/ .08	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	30.1/ 2/ 30	35.9/ 2/ 36	33.6/ 3/ 101	26.8/ 2/ 27
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.9/ 2/ 1	.5/ 3/ 2	.9/ 2/ 1
DILUTION FACTOR	40.22	30.15	11.57	37.70
HC CONCENTRATION PPM	15	19	34	20
CO CONCENTRATION PPM	22	22	30	19
CO2 CONCENTRATION PCT	.28	.40	1.07	.30
NOX CONCENTRATION PPM	29.4	35.0	99.4	25.9
HC MASS GRAMS	2.68	3.93	6.13	3.45
CO MASS GRAMS	7.79	7.88	11.04	6.75
CO2 MASS GRAMS	1569.0	2237.0	6173.0	1693.6
NOX MASS GRAMS	16.20	19.54	56.42	14.32
FUEL KG (LB)	.500 (1.10)	.713 (1.57)	1.958 (4.32)	.541 (1.19)
KW HR (HP HR)	1.71 (2.29)	2.74 (3.68)	8.87 (11.89)	1.60 (2.15)
BSHC G/KW HR (G/HP HR)	1.57 (1.17)	1.25 (.93)	.69 (.52)	2.16 (1.61)
BSCO G/KW HR (G/HP HR)	4.56 (3.40)	2.87 (2.14)	1.25 (.93)	4.22 (3.15)
BSCO2 G/KW HR (G/HP HR)	916.57 (683.48)	815.16 (607.87)	696.24 (519.19)	1057.99 (788.91)
BSNOX G/KW HR (G/HP HR)	9.49 (7.08)	7.12 (5.31)	6.36 (4.75)	8.95 (6.67)
BSFC KG/KW HR (LB/HP HR)	.293 (.481)	.260 (.427)	.221 (.363)	.338 (.555)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.92 (20.00)
BSHC G/KW HR (G/HP HR)	1.05 (.78)
BSCO G/KW HR (G/HP HR)	2.24 (1.67)
BSCO2 G/KW HR (G/HP HR)	782 (583)
BSNOX G/KW HR (G/HP HR)	7.14 (5.32) (from bag readings)
BSFC KG/KW HR (LB/HP HR)	.249 (.409)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.885 (31.26)
MULTIPLIER FOR	G/TEST	1.391
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0933 (.0696)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3750 (.1701)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	84.52 (2985.4)

TABLE C-2A. TEST D10-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 80 MACK ETSX
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D10-4 RUN
DATE 1/10/80
TIME 10:36
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0012

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	386.1 (15.2)	386.1 (15.2)	386.1 (15.2)	386.1 (15.2)
BLOWER INLET P MM. H2O(IN. H2O)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6271	6372	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	304.3 (10747)	308.6 (10899)	313.6 (11075)	305.2 (10781)
HC SAMPLE METER/RANGE/PPM	13.4/11/ 13	15.3/11/ 15	29.4/11/ 29	13.1/11/ 13
HC BCKGRD METER/RANGE/PPM	6.3/ 1/ 6	6.2/ 1/ 6	5.8/ 1/ 6	6.2/ 1/ 6
CO SAMPLE METER/RANGE/PPM	22.3/13/ 20	26.6/13/ 24	42.5/13/ 39	17.2/13/ 15
CO BCKGRD METER/RANGE/PPM	2.8/13/ 2	2.4/13/ 2	2.1/13/ 2	2.1/13/ 2
CO2 SAMPLE METER/RANGE/PCT	24.3/ 3/ .40	32.0/ 3/ .53	72.2/ 3/ 1.31	20.8/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.6/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	19.8/ 2/ 20	27.7/ 2/ 28	86.9/ 2/ 87	20.4/ 2/ 20
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	33.61	25.03	10.18	39.64
HC CONCENTRATION PPM	7	4	24	7
CO CONCENTRATION PPM	17	21	36	13
CO2 CONCENTRATION PCT	.36	.49	1.27	.30
NOX CONCENTRATION PPM	18.6	26.6	85.9	19.3
HC MASS GRAMS	1.28	1.66	4.37	1.24
CO MASS GRAMS	6.05	7.65	13.20	4.66
CO2 MASS GRAMS	1980.2	2787.8	7311.5	1665.9
NOX MASS GRAMS	10.86	15.75	51.59	11.30
FUEL KG (LB)	.629 (1.39)	.884 (1.95)	2.316 (5.11)	.629 (1.17)
KW HR (HP HR)	1.76 (2.36)	2.76 (3.70)	8.67 (11.63)	1.76 (2.36)
BSHC G/KW HR (G/HP HR)	.73 (.54)	.60 (.45)	.50 (.38)	.71 (.53)
BSCO G/KW HR (G/HP HR)	3.44 (2.57)	2.77 (2.07)	1.52 (1.13)	2.65 (1.98)
BSCO2 G/KW HR (G/HP HR)	1125.68 (839.42)	1009.38 (752.70)	843.06 (628.67)	947.01 (706.19)
BSNOX G/KW HR (G/HP HR)	6.17 (4.60)	5.70 (4.25)	5.95 (4.44)	6.42 (4.79)
BSFC KG/KW HR (LB/HP HR)	.357 (.587)	.320 (.526)	.267 (.439)	.301 (.494)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.95 (20.05)	
BSHC G/KW HR (G/HP HR)	.57 (.43)	
BSCO G/KW HR (G/HP HR)	2.11 (1.57)	
BSCO2 G/KW HR (G/HP HR)	919 (685)	
BSNOX G/KW HR (G/HP HR)	5.99 (4.46)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.291 (.479)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.838 (29.58)
MULTIPLIER FOR	G/TEST	1.471
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0983 (.0733)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3375 (.1531)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.72 (2886.4)

TABLE C-2A (CONT'D). TEST D10-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 80 MACK ETSX
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D10-4 RUN
DATE 1/10/80
TIME 11:16
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0063

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)	381.0 (15.0)
BLOWER INLET P MM. H2O(IN. H2O)	375.9 (14.8)	375.9 (14.8)	375.9 (14.8)	375.9 (14.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6266	6372	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	304.7 (10762)	308.8 (10906)	314.0 (11090)	305.7 (10796)
HC SAMPLE METER/RANGE/PPM	11.9/11/ 12	15.3/11/ 15	28.5/11/ 29	12.8/11/ 13
HC BCKGRD METER/RANGE/PPM	5.8/ 1/ 6	6.1/ 1/ 6	7.8/ 1/ 8	9.0/ 1/ 9
CO SAMPLE METER/RANGE/PPM	14.2/13/ 17	25.5/13/ 23	44.1/13/ 41	17.0/13/ 15
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1	1.3/13/ 1	1.2/13/ 1	1.4/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.4/ 3/ .35	30.8/ 3/ .51	71.2/ 3/ 1.29	20.1/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.1/ 3/ .03	2.6/ 3/ .04	2.8/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	20.6/ 2/ 21	30.4/ 2/ 30	89.0/ 2/ 89	19.5/ 2/ 19
NOX BCKGRD METER/RANGE/PPM	2.3/ 2/ 2	.7/ 2/ 1	.8/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	38.47	26.09	10.34	41.09
HC CONCENTRATION PPM	6	9	21	4
CO CONCENTRATION PPM	16	21	38	14
CO2 CONCENTRATION PCT	.31	.47	1.25	.28
NOX CONCENTRATION PPM	18.4	29.7	88.3	18.8
HC MASS GRAMS	1.09	1.67	3.89	.70
CO MASS GRAMS	5.61	7.42	14.05	4.81
CO2 MASS GRAMS	1753.6	2667.5	7187.8	1584.5
NOX MASS GRAMS	10.77	17.67	53.36	11.07
FUEL KG (LB)	.557 (1.23)	.846 (1.87)	2.277 (5.02)	.503 (1.11)
KW HR (HP HR)	1.83 (2.45)	2.80 (3.75)	8.67 (11.63)	1.74 (2.34)
BSHC G/KW HR (G/HP HR)	.60 (.45)	.60 (.45)	.45 (.33)	.40 (.30)
BSCO G/KW HR (G/HP HR)	3.07 (2.29)	2.73 (2.03)	1.62 (1.21)	2.76 (2.06)
BSCO2 G/KW HR (G/HP HR)	958.51 (714.76)	953.67 (711.15)	828.80 (618.03)	909.84 (678.47)
BSNOX G/KW HR (G/HP HR)	5.89 (4.39)	6.32 (4.71)	6.15 (4.59)	6.36 (4.74)
BSFC KG/KW HR (LB/HP HR)	.304 (.500)	.303 (.497)	.263 (.432)	.289 (.474)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.04 (20.17)	
BSHC G/KW HR (G/HP HR)	.49 (.36)	
BSCO G/KW HR (G/HP HR)	2.13 (1.59)	
BSCO2 G/KW HR (G/HP HR)	877 (654)	
BSNOX G/KW HR (G/HP HR)	6.17 (4.60)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.298 (.457)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.896 (31.65)
MULTIPLIER FOR	G/TEST	1.376
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0915 (.0682)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3290 (.1492)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.44 (2911.9)

TABLE C-2B. TEST D10-6 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL 6cMACK ETSX
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D10-6 RUN
DATE 1/15/80
TIME 10:23
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 11.5 GM/KG(80.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0261

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)
BLOWER INLET P MM. H2O(IN. H2O)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6204	6266	6371	6202
TIME SECONDS	297.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	306.5 (10825)	309.5 (10933)	314.7 (11116)	306.4 (10821)
HC SAMPLE METER/RANGE/PPM	12.7/11/ 13	14.8/11/ 15	28.4/11/ 28	12.4/11/ 12
HC BCKGRD METER/RANGE/PPM	4.2/ 1/ 4	4.5/ 1/ 5	4.7/ 1/ 5	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	22.1/13/ 20	26.4/13/ 24	42.6/13/ 40	16.0/13/ 14
CO BCKGRD METER/RANGE/PPM	1.6/13/ 1	2.0/13/ 2	1.2/13/ 1	.8/13/ 1
CO2 SAMPLE METER/RANGE/PCT	24.1/ 3/ .39	31.0/ 3/ .51	71.7/ 3/ 1.30	20.7/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.1/ 3/ .03	2.4/ 3/ .04	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	19.8/ 2/ 20	26.1/ 2/ 26	84.5/ 2/ 84	20.5/ 2/ 20
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.9/ 2/ 0	.9/ 2/ 0	.5/ 2/ 1
DILUTION FACTOR	33.91	25.90	10.26	39.86
HC CONCENTRATION PPM	9	10	24	6
CO CONCENTRATION PPM	18	21	37	13
CO2 CONCENTRATION PCT	.36	.48	1.27	.30
NOX CONCENTRATION PPM	19.2	25.7	84.1	20.0
HC MASS GRAMS	1.52	1.87	4.38	1.00
CO MASS GRAMS	6.39	7.73	13.54	4.69
CO2 MASS GRAMS	2008.7	2736.3	7295.6	1687.8
NOX MASS GRAMS	11.56	15.63	51.98	12.04
FUEL KG (LB)	.638 (1.41)	.868 (1.91)	2.311 (5.09)	.535 (1.18)
KW HR (HP HR)	1.79 (2.41)	2.76 (3.70)	8.71 (11.68)	1.72 (2.31)
BSHC G/KW HR (G/HP HR)	.85 (.63)	.68 (.50)	.50 (.38)	.58 (.43)
BSCO G/KW HR (G/HP HR)	3.56 (2.65)	2.80 (2.09)	1.55 (1.16)	2.72 (2.03)
BSCO2 G/KW HR (G/HP HR)	1119.46 (834.78)	990.76 (738.81)	837.83 (624.77)	979.01 (730.04)
BSNOX G/KW HR (G/HP HR)	6.44 (4.80)	5.66 (4.22)	5.97 (4.45)	6.98 (5.21)
BSFC KG/KW HR (LB/HP HR)	.356 (.584)	.314 (.517)	.265 (.436)	.311 (.511)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.99 (20.10)	
BSHC G/KW HR (G/HP HR)	.59 (.44)	
BSCO G/KW HR (G/HP HR)	2.16 (1.61)	
BSCO2 G/KW HR (G/HP HR)	916 (683)	
BSNOX G/KW HR (G/HP HR)	6.09 (4.54)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.290 (.477)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.839 (29.63)
MULTIPLIER FOR	G/TEST	1.475
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0984 (.0734)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3388 (.1537)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.32 (2907.6)

TABLE C-2B (CONT'D). TEST D10-6 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.MACK
ENGINE MODEL &OMACK E7SX
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 10

TEST NO.D10-6 RUN
DATE 1/15/80
TIME 11:06
DYNO NO. 5

DIESEL EM-221-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0061

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)	370.8 (14.6)
BLOWER INLET P MM. H2O(IN. H2O)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)	360.7 (14.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6265	6371	6203
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	305.3 (10784)	309.4 (10929)	314.7 (11114)	306.4 (10821)
HC SAMPLE METER/RANGE/PPM	12.2/11/ 12	15.6/11/ 16	29.7/11/ 30	13.0/11/ 13
HC BCKGRD METER/RANGE/PPM	7.9/ 1/ 8	6.7/ 1/ 7	6.8/ 1/ 7	6.9/ 1/ 7
CO SAMPLE METER/RANGE/PPM	18.7/13/ 17	25.8/13/ 23	45.5/13/ 42	16.9/13/ 15
CO BCKGRD METER/RANGE/PPM	.4/13/ 0	.5/13/ 0	.4/13/ 0	.5/13/ 0
CO2 SAMPLE METER/RANGE/PCT	21.8/ 3/ .35	30.7/ 3/ .51	71.0/ 3/ 1.28	21.0/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	16.3/ 2/ 16	23.4/ 2/ 23	70.3/ 2/ 70	20.4/ 2/ 21
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.6/ 2/ 1	.8/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	37.73	26.17	10.37	39.25
HC CONCENTRATION PPM	4	9	24	6
CO CONCENTRATION PPM	16	22	40	14
CO2 CONCENTRATION PCT	.31	.47	1.25	.30
NOX CONCENTRATION PPM	15.7	22.8	69.6	20.2
HC MASS GRAMS	.79	1.63	4.27	1.11
CO MASS GRAMS	5.64	7.98	14.81	5.06
CO2 MASS GRAMS	1753.8	2696.1	7179.4	1682.8
NOX MASS GRAMS	9.23	13.59	42.13	11.92
FUEL KG (LB)	.556 (1.23)	.840 (1.85)	2.275 (5.02)	.534 (1.18)
KW HR (HP HR)	1.78 (2.38)	2.76 (3.70)	8.69 (11.65)	1.72 (2.31)
BSHC G/KW HR (G/HP HR)	.44 (.33)	.59 (.44)	.49 (.37)	.64 (.48)
BSCO G/KW HR (G/HP HR)	3.17 (2.37)	2.89 (2.15)	1.70 (1.27)	2.94 (2.19)
BSCO2 G/KW HR (G/HP HR)	987.10 (736.08)	958.10 (714.46)	826.16 (616.07)	976.13 (727.90)
BSNOX G/KW HR (G/HP HR)	5.20 (3.88)	4.92 (3.67)	4.85 (3.62)	6.91 (5.16)
BSFC KG/KW HR (LB/HP HR)	.313 (.515)	.304 (.500)	.262 (.430)	.310 (.509)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.95 (20.05)	
BSHC G/KW HR (G/HP HR)	.52 (.39)	
BSCO G/KW HR (G/HP HR)	2.24 (1.67)	
BSCO2 G/KW HR (G/HP HR)	887 (661)	
BSNOX G/KW HR (G/HP HR)	5.14 (3.83)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.281 (.462)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.835 (29.50)
MULTIPLIER FOR	G/TEST	1.480
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0990 (.0738)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3519 (.1596)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.00 (2896.2)

TABLE C-3A. TEST D11-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C 903
ENGINE MODEL 79 CUMMINS VTB 903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-1 RUN
DATE 2/ 1/80
TIME 01:53
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 751.84 MM HG(29.60 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 49. PCT
ABSOLUTE HUMIDITY 8.3 GM/KG(57.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)
BLOWER INLET P MM. H2O(IN. H2O)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179.	6266.	6372.	6202.
TIME SECONDS	295.9	300.2	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	310.6 (10970.)	315.0 (11125.)	320.3 (11313.)	311.8 (11011.)
HC SAMPLE METER/RANGE/PPM	52.9/11/ 53.	73.2/11/ 73.	92.3/11/ 92.	40.3/11/ 40.
HC BCKGRD METER/RANGE/PPM	9.0/ 1/ 9.	9.1/ 1/ 9.	9.9/ 1/ 9.	9.9/ 1/ 10.
CO SAMPLE METER/RANGE/PPM	26.8/13/ 24.	24.2/13/ 22.	27.7/13/ 25.	15.2/13/ 13.
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2.	.8/13/ 1.	.8/13/ 1.	.8/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	21.9/ 3/ .35	27.1/ 3/ .44	59.3/ 3/ 1.05	18.1/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	3.0/ 3/ .05	3.0/ 3/ .05	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	18.5/ 2/ 19.	27.4/ 2/ 27.	89.3/ 2/ 89.	16.7/ 2/ 17.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	1.1/ 2/ 1.	1.1/ 2/ 1.	1.1/ 2/ 1.
DILUTION FACTOR	37.05	29.53	12.63	45.44
HC CONCENTRATION PPM	44.	64.	84.	31.
CO CONCENTRATION PPM	22.	20.	23.	12.
CO2 CONCENTRATION PCT	.32	.40	1.01	.25
NOX CONCENTRATION PPM	17.7	26.3	88.3	15.6
HC MASS GRAMS	7.90	11.70	15.45	5.51
CO MASS GRAMS	7.95	7.51	8.74	4.52
CO2 MASS GRAMS	1802.5	2307.2	5905.5	1905.3
NOX MASS GRAMS	10.53	15.87	54.09	9.32
FUEL KG (LB)	.580 (1.28)	.743 (1.64)	1.881 (4.15)	.451 (.99)
KW HR (HP HR)	1.34 (1.79)	2.23 (3.00)	7.35 (9.86)	1.25 (1.67)
BSHC G/KW HR (G/HP HR)	5.91 (4.41)	5.24 (3.91)	2.10 (1.57)	4.41 (3.29)
BSCO G/KW HR (G/HP HR)	5.95 (4.43)	3.36 (2.51)	1.19 (.89)	3.62 (2.70)
BSCO2 G/KW HR (G/HP HR)	1348.20 (1005.35)	1032.71 (770.09)	803.12 (598.84)	1125.17 (839.04)
BSNOX G/KW HR (G/HP HR)	7.88 (5.87)	7.10 (5.30)	7.36 (5.49)	7.46 (5.56)
BSFC KG/KW HR (LB/HP HR)	.434 (.713)	.332 (.547)	.256 (.421)	.361 (.593)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.17 (16.32)	
BSHC G/KW HR (G/HP HR)	3.33 (2.48)	
BSCO G/KW HR (G/HP HR)	2.36 (1.76)	
BSCO2 G/KW HR (G/HP HR)	938. (700.)	
BSNOX G/KW HR (G/HP HR)	7.38 (5.50)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.300 (.494)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.957 (33.80)
MULTIPLIER FOR	G/TEST	1.314
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1080 (.0805)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3596 (.1631)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	83.68 (2955.7)

TABLE C-3A (CONT'D). TEST D11-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.C 903
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-1 RUN
DATE 2/ 1/80
TIME 02:40
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 751.84 MM HG(29.60 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 49. PCT
ABSOLUTE HUMIDITY 8.3 GM/KG(57.8 GRAINS/LB) NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	350.5 (13.8)	350.5 (13.8)	350.5 (13.8)	350.5 (13.8)
BLOWER INLET P MM. H2O(IN. H2O)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)	348.0 (13.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6264.	6372.	6201.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	310.7 (10975.)	314.9 (11123.)	320.3 (11314.)	311.7 (11011.)
HC SAMPLE METER/RANGE/PPM	6.7/22/ 33.	9.2/22/ 46.	8.2/22/ 41.	7.2/22/ 36.
HC BCKGRD METER/RANGE/PPM	9.0/ 1/ 9.	9.9/ 1/ 10.	11.0/ 1/ 11.	12.0/ 1/ 12.
CO SAMPLE METER/RANGE/PPM	16.9/13/ 15.	20.1/13/ 18.	23.6/13/ 21.	16.2/13/ 14.
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1.	.9/13/ 1.	1.0/13/ 1.	1.0/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	18.1/ 3/ .29	25.6/ 3/ .42	58.4/ 3/ 1.03	17.9/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.1/ 3/ .05	3.1/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	16.7/ 2/ 17.	30.7/ 2/ 31.	33.8/ 3/ 101.	17.8/ 2/ 18.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.8/ 2/ 1.	.3/ 3/ 1.	.9/ 2/ 1.
DILUTION FACTOR	45.53	31.58	12.92	46.02
HC CONCENTRATION PPM	25.	36.	31.	24.
CO CONCENTRATION PPM	14.	17.	20.	13.
CO2 CONCENTRATION PCT	.24	.37	.99	.24
NOX CONCENTRATION PPM	15.9	29.9	100.6	16.9
HC MASS GRAMS	4.40	6.58	5.71	4.38
CO MASS GRAMS	4.96	6.12	7.30	4.78
CO2 MASS GRAMS	1379.9	2146.0	5792.8	1377.9
NOX MASS GRAMS	9.46	18.03	61.63	10.09
FUEL KG (LB)	.440 (.97)	.686 (1.51)	1.835 (4.05)	.441 (.97)
KW HR (HP HR)	1.28 (1.72)	2.29 (3.07)	7.34 (9.84)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	3.42 (2.55)	2.88 (2.15)	.78 (.58)	3.46 (2.58)
BSCO G/KW HR (G/HP HR)	3.86 (2.88)	2.68 (2.00)	.99 (.74)	3.78 (2.82)
BSCO2 G/KW HR (G/HP HR)	1070.68 (798.41)	938.38 (699.75)	789.68 (588.87)	1087.50 (810.95)
BSNOX G/KW HR (G/HP HR)(from bag readings)	7.37 (5.49)	7.88 (5.88)	8.40 (6.26)	7.97 (5.94)
BSFC KG/KW HR (LB/HP HR)	.343 (.564)	.300 (.493)	.250 (.411)	.348 (.572)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.17 (16.32)
BSHC G/KW HR (G/HP HR)	1.73 (1.29)
BSCO G/KW HR (G/HP HR)	1.90 (1.42)
BSCO2 G/KW HR (G/HP HR)	878. (655.)
BSNOX G/KW HR (G/HP HR)	8.15 (6.08)(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.280 (.460)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.013 (35.78)
MULTIPLIER FOR	G/TEST	1.241
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1020 (.0760)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3698 (.1655)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	83.94 (2964.6)

TABLE C-3B. TEST D11-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VT8903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-2 RUN
DATE 2/ 4/80
TIME 12:58
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 43. PCT
ABSOLUTE HUMIDITY 8.6 GM/KG(60.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183.	6266.	6372.	6202.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	301.1 (10636.)	305.2 (10779.)	310.3 (10961.)	302.1 (10669.)
HC SAMPLE METER/RANGE/PPM	10.5/22/ 52.	13.8/22/ 69.	17.6/22/ 88.	8.1/22/ 40.
HC BCKGRD METER/RANGE/PPM	9.9/ 1/ 10.	13.0/ 1/ 13.	12.1/ 1/ 12.	12.2/ 1/ 12.
CO SAMPLE METER/RANGE/PPM	28.7/13/ 26.	26.4/13/ 24.	30.9/13/ 28.	17.7/13/ 16.
CO BCKGRD METER/RANGE/PPM	2.5/13/ 2.	2.4/13/ 2.	2.3/13/ 2.	2.3/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	22.2/ 3/ .36	27.7/ 3/ .45	60.4/ 3/ 1.07	19.4/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	4.4/ 3/ .07	3.9/ 3/ .06	4.0/ 3/ .06	4.0/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	17.7/ 2/ 18.	27.4/ 2/ 27.	91.9/ 2/ 92.	17.0/ 2/ 17.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.7/ 2/ 1.	.7/ 2/ 1.	.8/ 2/ 1.
DILUTION FACTOR	36.52	28.87	12.38	42.27
HC CONCENTRATION PPM	43.	56.	77.	29.
CO CONCENTRATION PPM	23.	21.	25.	13.
CO2 CONCENTRATION PCT	.29	.40	1.01	.25
NOX CONCENTRATION PPM	17.0	26.7	91.3	16.2
HC MASS GRAMS	7.41	9.92	13.77	4.98
CO MASS GRAMS	8.16	7.53	9.12	4.73
CO2 MASS GRAMS	1618.2	2219.5	5765.6	1391.4
NOX MASS GRAMS	9.80	15.60	54.18	9.37
FUEL KG (LB)	.522 (1.15)	.713 (1.57)	1.836 (4.05)	.446 (.98)
KW HR (HP HR)	1.37 (1.84)	2.25 (3.02)	7.39 (9.91)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	5.40 (4.03)	4.40 (3.28)	1.86 (1.39)	3.93 (2.93)
BSCO G/KW HR (G/HP HR)	5.95 (4.44)	3.35 (2.50)	1.23 (.92)	3.73 (2.78)
BSCO2 G/KW HR (G/HP HR)	1179.34 (879.44)	985.68 (735.02)	780.36 (581.92)	1098.51 (819.16)
BSNOX G/KW HR (G/HP HR)	7.15 (5.33)	6.93 (5.17)	7.33 (5.47)	7.40 (5.52)
BSFC KG/KW HR (LB/HP HR)	.380 (.625)	.317 (.521)	.248 (.408)	.352 (.579)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.28 (16.47)	
BSHC G/KW HR (G/HP HR)	2.94 (2.19)	
BSCO G/KW HR (G/HP HR)	2.41 (1.79)	
BSCO2 G/KW HR (G/HP HR)	895. (668.)	
BSNOX G/KW HR (G/HP HR)	7.24 (5.40)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.286 (.471)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.954 (33.68)
MULTIPLIER FOR	G/TEST	1.278
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1041 (.0776)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3634 (.1648)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	83.49 (2948.9)

TABLE C-3B (CONT'D). TEST D11-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-2 RUN
DATE 2/ 4/80
TIME 01:45
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 43. PCT
ABSOLUTE HUMIDITY 8.6 GM/KG(60.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182.	6265.	6372.	6201.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	301.3 (10643.)	305.4 (10786.)	310.6 (10970.)	302.3 (10676.)
HC SAMPLE METER/RANGE/PPM	7.0/22/ 35.	9.1/22/ 46.	8.2/22/ 41.	7.2/22/ 36.
HC BCKGRD METER/RANGE/PPM	12.1/ 1/ 12.	12.2/ 1/ 12.	12.7/ 1/ 13.	12.7/ 1/ 13.
CO SAMPLE METER/RANGE/PPM	17.0/13/ 15.	19.3/13/ 17.	22.4/13/ 20.	15.5/13/ 14.
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1.	.9/13/ 1.	1.0/13/ 1.	1.1/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	18.9/ 3/ .30	26.5/ 3/ .43	59.5/ 3/ 1.05	17.7/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.2/ 3/ .05	3.7/ 3/ .06	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	17.3/ 2/ 17.	31.4/ 2/ 31.	34.5/ 3/ 104.	17.6/ 2/ 18.
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0.	.4/ 2/ 0.	.3/ 3/ 1.	.4/ 2/ 0.
DILUTION FACTOR	43.51	30.45	12.65	46.57
HC CONCENTRATION PPM	23.	34.	29.	23.
CO CONCENTRATION PPM	14.	16.	19.	12.
CO2 CONCENTRATION PCT	.25	.39	1.00	.24
NOX CONCENTRATION PPM	16.9	31.0	102.7	17.2
HC MASS GRAMS	3.99	5.95	5.22	4.09
CO MASS GRAMS	4.85	5.69	6.70	4.40
CO2 MASS GRAMS	1399.6	2161.0	5692.3	1316.8
NOX MASS GRAMS	9.75	18.12	61.00	9.95
FUEL KG (LB)	.448 (.99)	.690 (1.52)	1.803 (3.97)	.421 (.93)
KW HR (HP HR)	1.32 (1.77)	2.29 (3.07)	7.42 (9.96)	1.28 (1.72)
BSHC G/KW HR (G/HP HR)	3.02 (2.26)	2.60 (1.94)	.70 (.52)	3.19 (2.38)
BSCO G/KW HR (G/HP HR)	3.68 (2.74)	2.49 (1.86)	.90 (.67)	3.42 (2.55)
BSCO2 G/KW HR (G/HP HR)	1060.83 (791.06)	944.94 (704.64)	766.78 (571.79)	1025.42 (764.66)
BSNOX G/KW HR (G/HP HR)	7.39 (5.51)	7.92 (5.91)	8.22 (6.13)	7.75 (5.78)
BSFC KG/KW HR (LB/HP HR)	.339 (.558)	.302 (.496)	.243 (.399)	.328 (.539)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.31 (16.51)
BSHC G/KW HR (G/HP HR)	1.56 (1.17)
BSCO G/KW HR (G/HP HR)	1.76 (1.31)
BSCO2 G/KW HR (G/HP HR)	858. (640.)
BSNOX G/KW HR (G/HP HR)	8.02 (5.98) (from bag readings)
BSFC KG/KW HR (LB/HP HR)	.273 (.449)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.973 (34.38)
MULTIPLIER FOR	G/TEST	1.253
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1018 (.0759)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3727 (.1691)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	84.44 (2982.5)

TABLE C-4B (CONT'D). TEST D12-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5099-001

ENGINE NO. D12
ENGINE MODEL 79 CAT 3406 DITA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO.D12-4 RUN
DATE 3/18/80
TIME 09:34
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 749.30 MM HG(29.50 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 45. PCT
ABSOLUTE HUMIDITY 8.7 GM/KG(60.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	660.4 (26.0)	660.4 (26.0)	660.4 (26.0)	660.4 (26.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6173.	6205.	6379.	6191.
TIME SECONDS	296.0	300.0	305.0	297.6
TOTAL FLOW STD. CU. METRES(SCF)	293.9 (10381.)	295.5 (10436.)	303.7 (10727.)	294.8 (10412.)
HC SAMPLE METER/RANGE/PPM	26.7/11/ 27.	26.8/11/ 27.	31.8/11/ 32.	22.7/11/ 23.
HC BCKGRD METER/RANGE/PPM	6.3/ 1/ 6.	6.2/ 1/ 6.	6.1/ 1/ 6.	5.8/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	88.4/13/ 89.	96.1/13/ 93.	55.3/13/ 53.	92.7/13/ 90.
CO BCKGRD METER/RANGE/PCT	.8/13/ 1.	.6/13/ 1.	.4/13/ 0.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	25.9/ 3/ .92	32.8/ 3/ .55	76.8/ 3/ 1.90	24.5/ 3/ .90
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .09	2.6/ 3/ .09	2.8/ 3/ .09	2.6/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	52.2/ 2/ 52.	54.5/ 2/ 55.	51.6/ 3/ 155.	52.1/ 2/ 52.
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0.	.3/ 2/ 0.	.1/ 3/ 0.	.3/ 2/ 0.
DILUTION FACTOR	30.83	29.29	9.99	33.08
HC CONCENTRATION PPM	21.	21.	26.	17.
CO CONCENTRATION PPM	86.	92.	50.	38.
CO2 CONCENTRATION PCT	.38	.51	1.37	.36
NOX CONCENTRATION PPM	51.9	54.2	154.5	51.8
HC MASS GRAMS	3.49	3.56	4.61	2.91
CO MASS GRAMS	29.60	19.29	17.76	13.16
CO2 MASS GRAMS	2063.5	2797.6	7593.6	1995.5
NOX MASS GRAMS	29.19	30.69	89.78	29.22
FUEL KG (LB)	.662 (1.46)	.868 (1.91)	2.383 (5.25)	.616 (1.36)
KW HR (HP HR)	2.20 (2.95)	3.32 (4.46)	10.47 (14.04)	2.13 (2.85)
BSHC G/KW HR (G/HP HR)	1.59 (1.18)	1.07 (.80)	.44 (.33)	1.37 (1.02)
BSCO G/KW HR (G/HP HR)	13.96 (10.04)	4.30 (3.20)	1.70 (1.27)	6.18 (4.61)
BSCO2 G/KW HR (G/HP HR)	938.90 (699.77)	826.39 (616.24)	725.48 (540.99)	913.98 (681.56)
BSNOX G/KW HR (G/HP HR)	13.27 (9.90)	9.22 (6.87)	8.58 (6.40)	13.73 (10.24)
BSFC KG/KW HR (LB/HP HR)	.301 (.495)	.261 (.429)	.228 (.374)	.290 (.476)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	18.12 (24.30)	
BSHC G/KW HR (G/HP HR)	.80 (.60)	
BSCO G/KW HR (G/HP HR)	4.13 (3.08)	
BSCO2 G/KW HR (G/HP HR)	792. (591.)	
BSNOX G/KW HR (G/HP HR)	9.87 (7.36)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.250 (.411)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.954 (33.69)	
MULTIPLIER FOR	G/TEST	1.245	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0687 (.0513)	
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2750 (.1247)	

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.00 (2896.1)

TABLE C-3C (CONT'D). TEST D11-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5099-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-3 RUN
DATE 2/ 5/80
TIME 02:13
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 49. PCT
ABSOLUTE HUMIDITY 9.5 GM/KG(66.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182.	6265.	6371.	6202.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	300.7 (10622.)	304.8 (10765.)	309.9 (10947.)	301.7 (10657.)
HC SAMPLE METER/RANGE/PPM	6.9/22/ 32.	8.0/22/ 40.	8.0/22/ 40.	6.9/22/ 32.
HC BCKGRD METER/RANGE/PPM	7.7/ 1/ 8.	7.3/ 1/ 7.	7.9/ 1/ 8.	7.9/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	17.8/13/ 16.	21.0/13/ 19.	24.6/13/ 22.	15.9/13/ 14.
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1.	.9/13/ 1.	1.1/13/ 1.	1.9/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	17.9/ 3/ .28	25.5/ 3/ .42	58.3/ 3/ 1.03	16.5/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.2/ 3/ .03	2.3/ 3/ .04	2.3/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	16.9/ 2/ 16.	30.9/ 2/ 30.	97.9/ 2/ 97.	16.9/ 2/ 16.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.8/ 2/ 1.	1.0/ 2/ 1.	.9/ 2/ 1.
DILUTION FACTOR	47.43	31.79	12.99	50.13
HC CONCENTRATION PPM	29.	33.	33.	29.
CO CONCENTRATION PPM	15.	18.	20.	13.
CO2 CONCENTRATION PCT	.29	.38	1.00	.23
NOX CONCENTRATION PPM	15.6	29.6	96.5	15.5
HC MASS GRAMS	4.22	5.80	5.83	4.22
CO MASS GRAMS	5.08	6.21	7.36	4.92
CO2 MASS GRAMS	1390.6	2142.2	5658.2	1261.6
NOX MASS GRAMS	8.98	17.27	57.20	8.96
FUEL KG (LB)	.429 (.95)	.684 (1.51)	1.743 (3.85)	.404 (.89)
KW HR (HP HR)	1.32 (1.77)	2.27 (3.04)	7.30 (9.79)	1.25 (1.67)
BSHC G/KW HR (G/HP HR)	3.20 (2.39)	2.56 (1.91)	.80 (.60)	3.38 (2.52)
BSCO G/KW HR (G/HP HR)	3.85 (2.87)	2.74 (2.04)	1.01 (.75)	3.54 (2.64)
BSCO2 G/KW HR (G/HP HR)	1016.11 (757.71)	943.97 (703.92)	775.05 (577.95)	1010.12 (753.25)
BSNOX G/KW HR (G/HP HR)	6.81 (5.08)	7.61 (5.68)	7.84 (5.84)	7.17 (5.35)
BSFC KG/KW HR (LB/HP HR)	.325 (.535)	.301 (.496)	.246 (.404)	.324 (.532)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.14 (16.28)	
BSHC G/KW HR (G/HP HR)	1.65 (1.23)	
BSCO G/KW HR (G/HP HR)	1.90 (1.42)	
BSCO2 G/KW HR (G/HP HR)	857. (639.)	
BSNOX G/KW HR (G/HP HR)	7.61 (5.68)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.273 (.448)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.972 (34.34)
MULTIPLIER FOR	G/TEST	1.252
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1031 (.0769)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3781 (.1715)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.18 (2867.4)

TABLE C-3C. TEST D11-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5099-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-3 RUN
DATE 2/ 5/80
TIME 01:25
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 96. PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)	508.0 (20.0)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180.	6265.	6371.	6201.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	301.1 (10636.)	305.3 (10782.)	310.9 (10969.)	302.1 (10672.)
HC SAMPLE METER/RANGE/PPM	10.1/22/ 50.	12.7/22/ 63.	15.9/22/ 80.	7.6/22/ 38.
HC BCKGRD METER/RANGE/PPM	6.7/ 1/ 7.	8.0/ 1/ 8.	8.7/ 1/ 9.	9.8/ 1/ 10.
CO SAMPLE METER/RANGE/PPM	26.9/13/ 24.	24.6/13/ 22.	28.2/13/ 25.	16.7/13/ 15.
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1.	.9/13/ 1.	.7/13/ 1.	.7/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	21.1/ 3/ .34	26.8/ 3/ .44	58.9/ 3/ 1.04	17.4/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.9/ 3/ .04	2.3/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	17.5/ 2/ 18.	27.2/ 2/ 27.	88.2/ 2/ 88.	16.3/ 2/ 16.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.9/ 2/ 1.	.6/ 2/ 1.	.7/ 2/ 1.
DILUTION FACTOR	38.54	29.94	12.74	37.34
HC CONCENTRATION PPM	44.	56.	72.	28.
CO CONCENTRATION PPM	22.	21.	24.	14.
CO2 CONCENTRATION PCT	.30	.40	1.01	.24
NOX CONCENTRATION PPM	16.9	26.3	87.6	15.6
HC MASS GRAMS	7.61	9.79	12.81	4.96
CO MASS GRAMS	7.85	7.39	8.67	4.88
CO2 MASS GRAMS	1671.8	2256.9	5734.8	1330.2
NOX MASS GRAMS	9.79	15.38	52.05	9.03
FUEL KG (LB)	.539 (1.19)	.725 (1.60)	1.825 (4.02)	.427 (.94)
KW HR (HP HR)	1.34 (1.79)	2.25 (3.02)	7.30 (9.79)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	5.69 (4.25)	4.35 (3.24)	1.75 (1.31)	3.92 (2.92)
BSCO G/KW HR (G/HP HR)	5.87 (4.38)	3.28 (2.45)	1.19 (.89)	3.86 (2.88)
BSCO2 G/KW HR (G/HP HR)	1250.45 (932.46)	1002.10 (747.27)	785.54 (585.78)	1050.22 (783.15)
BSNOX G/KW HR (G/HP HR)	7.29 (5.43)	6.83 (5.09)	7.13 (5.32)	7.13 (5.31)
BSFC KG/KW HR (LB/HP HR)	.403 (.662)	.322 (.529)	.250 (.411)	.337 (.554)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.16 (16.30)	
BSHC G/KW HR (G/HP HR)	2.89 (2.16)	
BSCO G/KW HR (G/HP HR)	2.37 (1.77)	
BSCO2 G/KW HR (G/HP HR)	909. (679.)	
BSNOX G/KW HR (G/HP HR)	7.09 (5.29)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.289 (.475)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.888 (31.35)
MULTIPLIER FOR	G/TEST	1.373
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1130 (.0842)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3907 (.1772)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.93 (2911.3)

TABLE C-3D. TEST D11-4 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-4 RUN
DATE 2/ 6/80
TIME 10:30
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 748.28 MM HG(29.46 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 42. PCT
ABSOLUTE HUMIDITY 9.1 GM/KG(63.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET P MM. H2O(IN. H2O)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182.	6266.	6373.	6202.
TIME SECONDS	295.9	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	302.0 (10667.)	306.1 (10812.)	311.3 (10997.)	303.0 (10702.)
HC SAMPLE METER/RANGE/PPM	11.2/22/ 56.	9.7/22/ 49.	10.8/22/ 54.	8.2/22/ 41.
HC BCKGRD METER/RANGE/PPM	7.0/ 1/ 7.	6.7/ 1/ 7.	7.3/ 1/ 7.	7.7/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	24.0/13/ 21.	21.3/13/ 19.	23.4/13/ 21.	19.5/13/ 17.
CO BCKGRD METER/RANGE/PPM	1.4/13/ 1.	1.4/13/ 1.	1.8/13/ 2.	1.9/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	21.1/ 3/ .34	27.1/ 3/ .44	57.4/ 3/ 1.01	17.8/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.6/ 3/ .04	2.7/ 3/ .04	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	17.6/ 2/ 18.	27.8/ 2/ 28.	86.4/ 2/ 86.	17.3/ 2/ 17.
NOX BCKGRD METER/RANGE/PPM	1.4/ 2/ 2.	2.0/ 2/ 2.	1.4/ 2/ 2.	1.4/ 2/ 2.
DILUTION FACTOR	38.50	29.71	13.15	96.16
HC CONCENTRATION PPM	44.	42.	47.	39.
CO CONCENTRATION PPM	20.	17.	19.	15.
CO2 CONCENTRATION PCT	.30	.41	.47	.25
NOX CONCENTRATION PPM	15.7	25.9	89.6	15.4
HC MASS GRAMS	8.60	7.46	8.45	5.89
CO MASS GRAMS	6.98	6.19	6.81	5.42
CO2 MASS GRAMS	1660.2	2275.7	5549.8	1362.9
NOX MASS GRAMS	9.10	15.15	50.41	8.95
FUEL KG (LB)	.535 (1.18)	.728 (1.60)	1.761 (3.88)	.438 (.97)
KW HR (HP HR)	1.25 (1.67)	2.22 (2.97)	7.19 (9.65)	1.28 (1.72)
BSHC G/KW HR (G/HP HR)	6.89 (5.14)	3.37 (2.51)	1.18 (.88)	4.58 (3.42)
BSCO G/KW HR (G/HP HR)	5.59 (4.17)	2.79 (2.08)	.95 (.71)	4.22 (3.15)
BSCO2 G/KW HR (G/HP HR)	1329.20 (991.19)	1026.70 (765.61)	771.35 (575.20)	1061.32 (791.42)
BSNOX G/KW HR (G/HP HR)	7.29 (5.43)	6.83 (5.10)	7.01 (5.22)	6.97 (5.20)
BSFC KG/KW HR (LB/HP HR)	.429 (.705)	.328 (.540)	.295 (.402)	.341 (.561)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.44 (14.02)
BSHC G/KW HR (G/HP HR)	2.55 (1.90)
BSCO G/KW HR (G/HP HR)	2.13 (1.59)
BSCO2 G/KW HR (G/HP HR)	908. (677.)
BSNOX G/KW HR (G/HP HR)	7.00 (5.22)(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.290 (.477)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.941 (33.22)
MULTIPLIER FOR	G/TEST	1.300
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1088 (.0811)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3753 (.1702)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.73 (2922.0)

TABLE C-3D (CONT'D). TEST D11-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VTB903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-4 RUN
DATE 2/ 6/80
TIME 11:09
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 748.28 MM HG(29.46 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 47. PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(65.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)	510.5 (20.1)
BLOWER INLET P MM. H2O(IN. H2O)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183.	6265.	6372.	6202.
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	302.0 (10668.)	306.0 (10809.)	311.3 (10999.)	303.0 (10701.)
HC SAMPLE METER/RANGE/PPM	8.6/22/ 43.	9.7/22/ 48.	6.4/22/ 32.	8.0/22/ 40.
HC BCKGRD METER/RANGE/PPM	6.5/ 1/ 7.	6.8/ 1/ 7.	7.0/ 1/ 7.	6.9/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	21.6/13/ 19.	22.9/13/ 20.	22.1/13/ 20.	20.7/13/ 18.
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2.	1.5/13/ 1.	1.5/13/ 1.	1.2/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	18.6/ 3/ .30	25.5/ 3/ .42	57.4/ 3/ 1.01	18.4/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .09	2.6/ 3/ .09	2.5/ 3/ .09	2.8/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	17.8/ 2/ 18.	30.8/ 2/ 31.	97.4/ 2/ 97.	17.9/ 2/ 18.
NOX BCKGRD METER/RANGE/PPM	1.9/ 2/ 2.	2.0/ 2/ 2.	2.1/ 2/ 2.	2.0/ 2/ 2.
DILUTION FACTOR	44.06	31.67	13.18	44.61
HC CONCENTRATION PPM	37.	42.	26.	33.
CO CONCENTRATION PPM	17.	19.	18.	17.
CO2 CONCENTRATION PCT	.26	.38	.98	.25
NOX CONCENTRATION PPM	15.9	28.9	95.5	15.9
HC MASS GRAMS	6.39	7.40	9.60	5.77
CO MASS GRAMS	6.07	6.68	6.47	6.01
CO2 MASS GRAMS	1491.6	2117.6	5564.6	1402.2
NOX MASS GRAMS	9.21	16.90	56.84	9.29
FUEL KG (LB)	.464 (1.02)	.678 (1.50)	1.762 (3.88)	.451 (.99)
KW HR (HP HR)	1.34 (1.79)	2.22 (2.97)	7.16 (9.60)	1.30 (1.75)
BSHC G/KW HR (G/HP HR)	4.78 (3.57)	3.34 (2.49)	.64 (.48)	4.43 (3.30)
BSCO G/KW HR (G/HP HR)	4.54 (3.39)	3.01 (2.25)	.90 (.67)	4.62 (3.44)
BSCO2 G/KW HR (G/HP HR)	1078.26 (804.06)	955.37 (712.42)	777.21 (579.57)	1077.15 (803.23)
BSNOX G/KW HR (G/HP HR)	6.89 (5.14)	7.62 (5.68)	7.94 (5.92)	7.10 (5.29)
BSFC KG/KW HR (LB/HP HR)	.347 (.570)	.306 (.503)	.246 (.405)	.346 (.569)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.01 (16.11)
BSHC G/KW HR (G/HP HR)	2.01 (1.50)
BSCO G/KW HR (G/HP HR)	2.10 (1.57)
BSCO2 G/KW HR (G/HP HR)	876. (653.)
BSNOX G/KW HR (G/HP HR)	7.67 (5.72) (from bag readings)
BSFC KG/KW HR (LB/HP HR)	.279 (.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.927 (32.73)
MULTIPLIER FOR	G/TEST	1.319
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1098 (.0819)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3932 (.1784)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.62 (2918.2)

TABLE C-3E. TEST D11-5 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VT8903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-5 RUN
DATE 2/ 7/80
TIME 09:30
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 44. PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)	495.3 (19.5)
BLOWER INLET P MM. H2O(IN. H2O)	492.8 (19.4)	492.8 (19.4)	492.8 (19.4)	492.8 (19.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6266.	6372.	6202.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.9 (10579.)	303.5 (10720.)	308.6 (10901.)	300.9 (10610.)
HC SAMPLE METER/RANGE/PPM	10.7/22/ 53.	9.6/22/ 48.	9.6/22/ 48.	10.0/22/ 50.
HC BCKGRD METER/RANGE/PPM	5.7/ 1/ 6.	5.8/ 1/ 6.	6.1/ 1/ 6.	7.5/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	25.0/13/ 22.	22.1/13/ 20.	24.7/13/ 22.	24.6/13/ 22.
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1.	.9/13/ 0.	.9/13/ 1.	1.0/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	20.6/ 3/ .33	27.0/ 3/ .44	58.2/ 3/ 1.03	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	16.9/ 2/ 17.	27.1/ 2/ 27.	89.0/ 2/ 89.	17.0/ 2/ 17.
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0.	.3/ 2/ 0.	.8/ 2/ 1.	.7/ 2/ 1.
DILUTION FACTOR	39.49	29.82	12.96	44.91
HC CONCENTRATION PPM	48.	42.	93.	43.
CO CONCENTRATION PPM	21.	19.	21.	21.
CO2 CONCENTRATION PCT	.29	.40	.99	.25
NOX CONCENTRATION PPM	16.7	26.8	88.3	16.3
HC MASS GRAMS	8.24	7.42	7.57	7.38
CO MASS GRAMS	7.33	6.69	7.43	7.26
CO2 MASS GRAMS	1590.6	2296.9	5607.1	1371.8
NOX MASS GRAMS	9.57	15.57	52.11	9.38
FUEL KG (LB)	.513 (1.13)	.719 (1.58)	1.779 (3.92)	.443 (.98)
KW HR (HP HR)	1.20 (1.60)	2.08 (2.78)	7.04 (9.44)	1.27 (1.70)
BSHC G/KW HR (G/HP HR)	6.89 (5.14)	3.58 (2.67)	1.08 (.80)	5.83 (4.35)
BSCO G/KW HR (G/HP HR)	6.13 (4.57)	3.22 (2.40)	1.06 (.79)	5.73 (4.28)
BSCO2 G/KW HR (G/HP HR)	1329.66 (991.53)	1082.20 (807.00)	796.85 (594.21)	1083.05 (807.63)
BSNOX G/KW HR (G/HP HR)	8.00 (5.96)	7.50 (5.59)	7.41 (5.52)	7.40 (5.52)
BSFC KG/KW HR (LB/HP HR)	.429 (.705)	.346 (.569)	.253 (.416)	.350 (.576)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.58 (15.52)
BSHC G/KW HR (G/HP HR)	2.64 (1.97)
BSCO G/KW HR (G/HP HR)	2.48 (1.85)
BSCO2 G/KW HR (G/HP HR)	934. (697.)
BSNOX G/KW HR (G/HP HR)	7.48 (5.58)(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.298 (.491)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.933 (32.97)
MULTIPLIER FOR	G/TEST	1.298
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1122 (.0836)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3759 (.1705)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.01 (2896.4)

TABLE C-3E (CONT'D). TEST D11-5 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 79 CUMMINS VT8903
ENGINE 14.8 L(903. CID) V-8
CVS NO. 10

TEST NO.D11-5 RUN
DATE 2/ 7/80
TIME 10:10
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 48. PCT
ABSOLUTE HUMIDITY 9.7 GM/KG(68.0 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)	505.5 (19.9)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183.	6265.	6372.	6202.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.3 (10570.)	303.2 (10710.)	308.9 (10843.)	300.2 (10602.)
HC SAMPLE METER/RANGE/PPM	10.1/22/ 50.	11.0/22/ 55.	7.0/22/ 35.	9.4/22/ 47.
HC BCKGRD METER/RANGE/PPM	6.3/ 1/ 6.	6.1/ 1/ 6.	6.2/ 1/ 6.	6.2/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	23.4/13/ 21.	24.6/13/ 22.	22.8/13/ 20.	22.8/13/ 20.
CO BCKGRD METER/RANGE/PPM	.8/13/ 1.	1.2/13/ 1.	.9/13/ 1.	1.1/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	17.9/ 3/ .29	25.0/ 3/ .41	56.5/ 3/ .94	16.8/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.7/ 3/ .04	2.4/ 3/ .04	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	16.4/ 2/ 16.	29.5/ 2/ 30.	95.0/ 2/ 95.	17.3/ 2/ 17.
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0.	.1/ 2/ 0.	.7/ 2/ 1.	.7/ 2/ 1.
DILUTION FACTOR	45.69	32.27	13.41	48.83
HC CONCENTRATION PPM	44.	49.	29.	41.
CO CONCENTRATION PPM	20.	21.	19.	19.
CO2 CONCENTRATION PCT	.25	.37	.96	.23
NOX CONCENTRATION PPM	16.2	29.4	94.4	16.6
HC MASS GRAMS	7.63	8.62	5.19	7.09
CO MASS GRAMS	6.90	7.25	6.80	6.65
CO2 MASS GRAMS	1371.8	2041.3	5420.9	1291.1
NOX MASS GRAMS	9.28	17.06	55.66	9.54
FUEL KG (LB)	.444 (.98)	.656 (1.45)	1.717 (3.79)	.417 (.92)
KW HR (HP HR)	1.30 (1.75)	2.13 (2.85)	7.04 (9.44)	1.28 (1.72)
BSHC G/KW HR (G/HP HR)	5.86 (4.37)	4.05 (3.02)	.74 (.55)	5.52 (4.12)
BSCO G/KW HR (G/HP HR)	5.30 (3.95)	3.41 (2.54)	.97 (.72)	5.18 (3.86)
BSCO2 G/KW HR (G/HP HR)	1053.82 (785.84)	959.01 (715.13)	770.40 (574.49)	1005.37 (749.70)
BSNOX G/KW HR (G/HP HR)	7.13 (5.31)	8.01 (5.97)	7.91 (5.90)	7.43 (5.54)
BSFC KG/KW HR (LB/HP HR)	.341 (.560)	.308 (.506)	.299 (.491)	.325 (.534)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.75 (15.76)	
BSHC G/KW HR (G/HP HR)	2.43 (1.81)	
BSCO G/KW HR (G/HP HR)	2.35 (1.75)	
BSCO2 G/KW HR (G/HP HR)	862. (643.)	
BSNOX G/KW HR (G/HP HR)	7.79 (5.81)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.275 (.452)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.939 (32.99)
MULTIPLIER FOR	G/TEST	1.297
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1103 (.0823)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4009 (.1818)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.86 (2926.6)

TABLE C-4A. TEST D12-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D12
ENGINE MODEL 79 CAT 3406 DITA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO.D12-3 RUN
DATE 3/17/80
TIME 01:39
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 745.49 MM HG(29.35 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 48. PCT
ABSOLUTE HUMIDITY 8.6 GM/KG(60.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)
BLOWER INLET P MM. H2O(IN. H2O)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6173.	6205.	6369.	6190.
TIME SECONDS	295.9	300.1	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	292.5 (10332.)	294.1 (10386.)	301.8 (10660.)	293.3 (10360.)
HC SAMPLE METER/RANGE/PPM	10.1/22/ 50.	5.6/22/ 28.	5.7/22/ 28.	3.8/22/ 19.
HC BCKGRD METER/RANGE/PPM	6.2/ 1/ 6.	8.1/ 1/ 8.	8.9/ 1/ 9.	9.2/ 1/ 9.
CO SAMPLE METER/RANGE/PPM	57.4/12/ 125.	58.7/13/ 56.	56.6/13/ 54.	47.6/13/ 45.
CO BCKGRD METER/RANGE/PPM	.4/12/ 1.	.8/13/ 1.	1.0/13/ 1.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	29.5/ 3/ .49	36.9/ 3/ .62	78.2/ 3/ 1.43	24.9/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	2.0/ 3/ .03	2.1/ 3/ .03	2.1/ 3/ .03	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	48.7/ 2/ 49.	59.3/ 2/ 59.	50.2/ 3/ 151.	54.5/ 2/ 55.
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0.	.6/ 2/ 1.	.8/ 3/ 2.	.9/ 2/ 1.
DILUTION FACTOR	26.59	21.31	9.30	32.51
HC CONCENTRATION PPM	44.	20.	20.	10.
CO CONCENTRATION PPM	121.	54.	51.	43.
CO2 CONCENTRATION PCT	.46	.59	1.40	.37
NOX CONCENTRATION PPM	48.4	58.7	148.5	53.6
HC MASS GRAMS	7.49	3.45	3.55	1.73
CO MASS GRAMS	41.19	18.55	17.93	14.75
CO2 MASS GRAMS	2450.2	3177.0	7759.0	2005.3
NOX MASS GRAMS	27.09	33.09	85.71	30.09
FUEL KG (LB)	.792 (1.75)	1.009 (2.21)	2.433 (5.36)	.635 (1.40)
KW HR (HP HR)	2.16 (2.90)	3.36 (4.51)	10.41 (13.97)	2.20 (2.95)
BSHC G/KW HR (G/HP HR)	3.46 (2.58)	1.03 (.77)	.34 (.25)	.79 (.59)
BSCO G/KW HR (G/HP HR)	19.04 (14.20)	5.52 (4.12)	1.72 (1.28)	6.71 (5.00)
BSCO2 G/KW HR (G/HP HR)	1132.41 (844.43)	945.54 (705.09)	745.05 (555.58)	911.95 (680.04)
BSNOX G/KW HR (G/HP HR)	12.52 (9.34)	9.83 (7.33)	8.23 (6.14)	13.68 (10.20)
BSFC KG/KW HR (LB/HP HR)	.366 (.602)	.299 (.491)	.234 (.384)	.289 (.474)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	18.14 (24.32)	
BSHC G/KW HR (G/HP HR)	.89 (.67)	
BSCO G/KW HR (G/HP HR)	5.10 (3.80)	
BSCO2 G/KW HR (G/HP HR)	849. (633.)	
BSNOX G/KW HR (G/HP HR)	9.70 (7.23)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.268 (.441)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.932 (32.90)
MULTIPLIER FOR	G/TEST	1.268
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0699 (.0522)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2608 (.1183)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.58 (2846.3)

TABLE C-4A (CONT'D). TEST D12-3 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D12
ENGINE MODEL 79 CAT 3406 DITA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO. D12-3 RUN
DATE 3/17/80
TIME 02120
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 44. PCT
ABSOLUTE HUMIDITY 8.7 GM/KG(61.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	767.1 (30.2)	767.1 (30.2)	767.1 (30.2)	767.1 (30.2)
BLOWER INLET P MM. H2O(IN. H2O)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6173.	6205.	6369.	6190.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	292.7 (10339.)	294.3 (10394.)	302.0 (10667.)	293.5 (10368.)
HC SAMPLE METER/RANGE/PPM	27.8/11/ 28.	27.1/11/ 27.	34.3/11/ 34.	26.1/11/ 26.
HC BCKGRD METER/RANGE/PPM	9.2/ 1/ 9.	9.1/ 1/ 9.	9.4/ 1/ 9.	9.7/ 1/ 10.
CO SAMPLE METER/RANGE/PPM	92.1/13/ 93.	49.8/13/ 47.	56.6/13/ 54.	46.1/13/ 43.
CO BCKGRD METER/RANGE/PPM	.5/13/ 0.	.5/13/ 0.	.5/13/ 0.	.6/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	25.9/ 3/ .42	33.7/ 3/ .56	78.1/ 3/ 1.43	25.4/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	1.8/ 3/ .03	1.8/ 3/ .03	2.3/ 3/ .04	2.4/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	54.3/ 2/ 54.	60.1/ 2/ 60.	51.9/ 3/ 156.	51.8/ 2/ 52.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.8/ 2/ 1.	.7/ 3/ 2.	.3/ 2/ 0.
DILUTION FACTOR	30.79	23.53	9.31	31.80
HC CONCENTRATION PPM	19.	18.	26.	17.
CO CONCENTRATION PPM	91.	45.	51.	42.
CO2 CONCENTRATION PCT	.40	.54	1.40	.37
NOX CONCENTRATION PPM	53.6	54.3	153.8	51.5
HC MASS GRAMS	3.20	3.12	4.52	2.83
CO MASS GRAMS	30.94	15.54	18.10	14.24
CO2 MASS GRAMS	2126.9	2887.8	7738.1	1997.6
NOX MASS GRAMS	30.03	33.40	88.87	28.92
FUEL KG (LB)	.682 (1.50)	.912 (2.01)	2.428 (5.35)	.633 (1.40)
KW HR (HP HR)	2.23 (3.00)	3.22 (4.32)	10.38 (13.92)	2.23 (3.00)
BSHC G/KW HR (G/HP HR)	1.43 (1.07)	.97 (.72)	.44 (.32)	1.26 (.94)
BSCO G/KW HR (G/HP HR)	13.85 (10.33)	4.83 (3.60)	1.74 (1.30)	6.37 (4.75)
BSCO2 G/KW HR (G/HP HR)	952.01 (709.91)	897.06 (668.94)	745.55 (555.96)	894.14 (666.76)
BSNOX G/KW HR (G/HP HR)	13.44 (10.02)	10.38 (7.74)	8.56 (6.39)	12.95 (9.65)
BSFC KG/KW HR (LB/HP HR)	.305 (.502)	.283 (.466)	.234 (.385)	.283 (.466)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	18.07 (24.23)	
BSHC G/KW HR (G/HP HR)	.76 (.56)	
BSCO G/KW HR (G/HP HR)	4.36 (3.25)	
BSCO2 G/KW HR (G/HP HR)	816. (609.)	
BSNOX G/KW HR (G/HP HR)	10.03 (7.48)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.258 (.424)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.920 (32.48)
MULTIPLIER FOR	G/TEST	1.286
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0712 (.0531)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2763 (.1253)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.73 (2886.8)

TABLE C-4B. TEST D12-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D12
ENGINE MODEL 79 CAT 3406 DITA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO.D12-4 RUN
DATE 3/18/80
TIME 08:54
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 749.30 MM HG(29.50 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 45. PCT
ABSOLUTE HUMIDITY 8.7 GM/KG(60.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)	769.6 (30.3)
BLOWER INLET P MM. H2O(IN. H2O)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)	652.8 (25.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6173.	6205.	6369.	6190.
TIME SECONDS	295.9	296.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	294.2 (10393.)	295.8 (10446.)	303.6 (10723.)	295.1 (10422.)
HC SAMPLE METER/RANGE/PPM	10.7/22/ 53.	6.2/22/ 31.	5.9/22/ 29.	4.1/22/ 21.
HC BCKGRD METER/RANGE/PPM	6.9/ 1/ 7.	6.8/ 1/ 7.	7.9/ 1/ 8.	7.2/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	41.3/12/ 85.	57.1/13/ 55.	55.1/13/ 52.	46.6/13/ 44.
CO BCKGRD METER/RANGE/PPM	.6/12/ 1.	1.3/13/ 1.	1.4/13/ 1.	2.1/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	31.0/ 3/ .51	37.4/ 3/ .63	77.8/ 3/ 1.42	26.0/ 3/ .43
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	3.0/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	48.2/ 2/ 48.	59.7/ 2/ 60.	52.7/ 3/ 158.	53.7/ 2/ 54.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.5/ 2/ 1.	.9/ 3/ 3.	.6/ 2/ 1.
DILUTION FACTOR	25.42	21.00	9.36	31.06
HC CONCENTRATION PPM	47.	24.	22.	14.
CO CONCENTRATION PPM	82.	52.	99.	41.
CO2 CONCENTRATION PCT	.47	.59	1.38	.38
NOX CONCENTRATION PPM	47.7	59.2	155.7	53.1
HC MASS GRAMS	7.92	9.15	3.89	2.32
CO MASS GRAMS	28.07	17.95	17.40	14.05
CO2 MASS GRAMS	2529.5	3181.7	7690.1	2040.5
NOX MASS GRAMS	26.86	33.51	90.41	29.98
FUEL KG (LB)	.811 (1.79)	1.006 (2.22)	2.412 (5.32)	.646 (1.42)
KW HR (HP HR)	2.20 (2.95)	3.36 (4.51)	10.47 (14.04)	2.15 (2.88)
BSHC G/KW HR (G/HP HR)	3.60 (2.69)	1.23 (.92)	.37 (.28)	1.08 (.81)
BSCO G/KW HR (G/HP HR)	12.77 (9.52)	5.34 (3.98)	1.66 (1.24)	6.54 (4.88)
BSCO2 G/KW HR (G/HP HR)	1150.33 (857.80)	946.94 (706.13)	734.70 (547.87)	950.78 (708.99)
BSNOX G/KW HR (G/HP HR)	12.22 (9.11)	9.97 (7.44)	8.64 (6.44)	13.47 (10.42)
BSFC KG/KW HR (LB/HP HR)	.369 (.606)	.299 (.492)	.230 (.379)	.301 (.495)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	18.17 (24.37)	
BSHC G/KW HR (G/HP HR)	1.01 (.75)	
BSCO G/KW HR (G/HP HR)	4.26 (3.18)	
BSCO2 G/KW HR (G/HP HR)	850. (634.)	
BSNOX G/KW HR (G/HP HR)	9.95 (7.42)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.268 (.441)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.957 (33.81)
MULTIPLIER FOR	G/TEST	1.242
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0683 (.0510)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2548 (.1156)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.32 (2872.1)

TABLE C-5A. TEST D13-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D13
ENGINE MODEL 79 CAT 3406 PCTA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO.D13-1 RUN
DATE 3/21/80
TIME 09:10
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 748.03 MM HG(29.45 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 51. PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6178.	6260.	6399.	6193.
TIME SECONDS	296.0	299.9	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	292.8 (10343.)	296.7 (10480.)	303.3 (10712.)	293.6 (10368.)
HC SAMPLE METER/RANGE/PPM	2.8/22/ 14.	2.8/22/ 14.	3.7/22/ 18.	3.3/22/ 16.
HC BCKGRD METER/RANGE/PPM	4.9/ 1/ 5.	4.9/ 1/ 5.	4.8/ 1/ 5.	5.0/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	65.1/13/ 63.	26.1/13/ 23.	24.8/13/ 22.	34.1/13/ 31.
CO BCKGRD METER/RANGE/PPM	.9/13/ 0.	.1/13/ 0.	.3/13/ 0.	.9/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	29.0/ 3/ .48	37.9/ 3/ .64	82.7/ 3/ 1.53	25.5/ 3/ .42
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.9/ 3/ .04	2.7/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	29.8/ 2/ 30.	39.7/ 2/ 40.	90.7/ 3/ 122.	28.7/ 2/ 29.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.6/ 2/ 1.	.3/ 3/ 1.	.5/ 2/ 1.
DILUTION FACTOR	27.60	20.85	8.76	31.83
HC CONCENTRATION PPM	9.	9.	14.	11.
CO CONCENTRATION PPM	61.	23.	21.	30.
CO2 CONCENTRATION PCT	.44	.60	1.49	.37
NOX CONCENTRATION PPM	29.2	39.1	121.3	28.2
HC MASS GRAMS	1.54	1.63	2.48	1.93
CO MASS GRAMS	20.92	7.84	7.41	10.26
CO2 MASS GRAMS	2357.4	3282.0	8271.5	2015.1
NOX MASS GRAMS	16.37	22.21	70.38	15.84
FUEL KG (LB)	.747 (1.65)	1.029 (2.27)	2.587 (5.70)	.636 (1.40)
KW HR (HP HR)	1.85 (2.48)	3.45 (4.62)	10.52 (14.11)	2.09 (2.81)
BSHC G/KW HR (G/HP HR)	.84 (.62)	.47 (.35)	.24 (.18)	.92 (.69)
BSCO G/KW HR (G/HP HR)	11.33 (8.45)	2.27 (1.70)	.70 (.53)	4.90 (3.65)
BSCO2 G/KW HR (G/HP HR)	1276.29 (951.73)	951.87 (709.81)	786.29 (586.34)	962.60 (717.81)
BSNOX G/KW HR (G/HP HR)	8.86 (6.61)	6.44 (4.80)	6.69 (4.99)	7.57 (5.64)
BSFC KG/KW HR (LB/HP HR)	.405 (.665)	.299 (.491)	.246 (.404)	.304 (.499)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.91 (24.02)	
BSHC G/KW HR (G/HP HR)	.42 (.32)	
BSCO G/KW HR (G/HP HR)	2.59 (1.93)	
BSCO2 G/KW HR (G/HP HR)	889. (663.)	
BSNOX G/KW HR (G/HP HR)	6.97 (5.20)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.279 (.459)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.992 (33.28)
MULTIPLIER FOR	G/TEST	1.259
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0703 (.0524)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2519 (.1143)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.17 (2866.9)

TABLE C-5A (CONT'D). TEST D13-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D13 — TEST NO.D13-2 RUN 2
ENGINE MODEL 79 CAT 3406 PCTA — DATE 3/24/80
ENGINE 14.6 L(893. CID) I-6 — TIME — DIESEL EM-408-F
CVS NO. 10 — DYNO NO. 5 — BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG) — RELATIVE HUMIDITY 38. PCT
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F) — ABSOLUTE HUMIDITY 8.2 GM/KG(57.5 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LANF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	678.2 (26.7)	678.2 (26.7)	678.2 (26.7)	678.2 (26.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6177.	6261.	6394.	6197.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	289.3 (10218.)	293.2 (10357.)	299.4 (10576.)	290.2 (10251.)
HC SAMPLE METER/RANGE/PPM	14.0/11/ 14.	25.9/11/ 26.	26.0/11/ 26.	23.1/11/ 23.
HC BCKGRD METER/RANGE/PPM	6.2/ 1/ 6.	5.9/ 1/ 6.	6.1/ 1/ 6.	6.0/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	54.0/13/ 51.	30.8/13/ 28.	27.4/13/ 25.	35.7/13/ 33.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	26.0/ 3/ .43	36.5/ 3/ .61	80.3/ 3/ 1.48	25.5/ 3/ .42
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.5/ 3/ .04	2.5/ 3/ .04	2.4/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	28.6/ 2/ 29.	41.2/ 2/ 41.	39.1/ 3/ 117.	28.9/ 2/ 29.
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1.	.9/ 2/ 1.	.3/ 3/ 1.	.7/ 2/ 1.
DILUTION FACTOR	31.06	21.67	9.05	31.77
HC CONCENTRATION PPM	8.	20.	21.	17.
CO CONCENTRATION PPM	50.	27.	29.	32.
CO2 CONCENTRATION PCT	.39	.58	1.44	.38
NOX CONCENTRATION PPM	27.6	40.3	116.5	28.2
HC MASS GRAMS	1.33	3.42	3.56	2.89
CO MASS GRAMS	16.91	9.27	8.23	10.79
CO2 MASS GRAMS	2063.9	3096.9	7907.3	2029.0
NOX MASS GRAMS	15.29	22.63	66.73	15.67
FUEL KG (LB)	.654 (1.44)	.974 (2.15)	2.475 (5.46)	.640 (1.41)
KW HR (HP HR)	2.08 (2.78)	3.36 (4.51)	10.36 (13.89)	2.02 (2.71)
BSHC G/KW HR (G/HP HR)	.64 (.48)	1.02 (.76)	.34 (.26)	1.43 (1.07)
BSCO G/KW HR (G/HP HR)	8.15 (6.08)	2.76 (2.06)	.79 (.59)	5.33 (3.98)
BSCO2 G/KW HR (G/HP HR)	994.28 (741.43)	921.70 (687.31)	763.15 (569.08)	1000.50 (746.07)
BSNOX G/KW HR (G/HP HR)	7.37 (5.44)	6.73 (5.02)	6.44 (4.80)	7.75 (5.78)
BSFC KG/KW HR (LB/HP HR)	.315 (.518)	.290 (.477)	.239 (.393)	.316 (.520)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.82 (23.90)
BSHC G/KW HR (G/HP HR)	.63 (.47)
BSCO G/KW HR (G/HP HR)	2.54 (1.89)
BSCO2 G/KW HR (G/HP HR)	847. (632.)
BSNOX G/KW HR (G/HP HR)	6.75 (5.03) (from bag readings)
BSFC KG/KW HR (LB/HP HR)	.266 (.437)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.907 (32.02)
MULTIPLIER FOR	G/TEST	1.293
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0725 (.0541)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2726 (.1237)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.82 (2854.4)

TABLE C-5B. TEST D13-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D13
ENGINE MODEL 79 CAT 3406 PCTA
ENGINE 14.6 L(893. CID) I-6
CVS NO. 10

TEST NO.D13-2 RUN
DATE 3/24/80
TIME 01:37
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 44. PCT
ABSOLUTE HUMIDITY 8.9 GM/KG(62.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	792.5 (31.2)	792.5 (31.2)	792.5 (31.2)	792.5 (31.2)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6175.	6262.	6382.	6194.
TIME SECONDS	295.9	300.0	305.0	296.8
TOTAL FLOW STD. CU. METRES(SCF)	289.1 (10211.)	293.2 (10355.)	298.8 (10553.)	290.0 (10243.)
HC SAMPLE METER/RANGE/PPM	3.6/22/ 18.	4.7/22/ 24.	4.2/22/ 21.	3.0/22/ 15.
HC BCKGRD METER/RANGE/PPM	5.8/ 1/ 6.	5.7/ 1/ 6.	6.5/ 1/ 7.	6.8/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	71.0/13/ 70.	35.1/13/ 32.	29.8/13/ 27.	35.0/13/ 32.
CO BCKGRD METER/RANGE/PPM	.3/13/ 0.	.9/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	30.4/ 3/ .50	38.5/ 3/ .65	82.4/ 3/ 1.52	25.4/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.4/ 3/ .04	2.4/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	30.1/ 2/ 30.	39.9/ 2/ 40.	39.5/ 3/ 114.	29.1/ 2/ 29.
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1.	.8/ 2/ 1.	.2/ 3/ 1.	.9/ 2/ 1.
DILUTION FACTOR	26.20	20.45	8.79	31.97
HC CONCENTRATION PPM	12.	18.	15.	8.
CO CONCENTRATION PPM	68.	31.	26.	31.
CO2 CONCENTRATION PCT	.47	.62	1.49	.38
NOX CONCENTRATION PPM	29.1	39.1	118.0	28.2
HC MASS GRAMS	2.07	3.06	2.67	1.37
CO MASS GRAMS	22.86	10.55	8.94	10.53
CO2 MASS GRAMS	2475.4	3302.4	8136.8	2005.2
NOX MASS GRAMS	16.11	21.95	67.43	15.66
FUEL KG (LB)	.786 (1.73)	1.039 (2.29)	2.546 (5.61)	.632 (1.39)
KW HR (HP HR)	2.09 (2.81)	3.31 (4.44)	10.43 (13.99)	2.06 (2.76)
BSHC G/KW HR (G/HP HR)	.99 (.74)	.93 (.69)	.26 (.19)	.67 (.50)
BSCO G/KW HR (G/HP HR)	10.92 (8.14)	3.19 (2.38)	.86 (.64)	5.12 (3.82)
BSCO2 G/KW HR (G/HP HR)	1182.47 (881.77)	998.55 (744.62)	780.01 (581.65)	974.24 (726.49)
BSNOX G/KW HR (G/HP HR)	7.70 (5.74)	6.64 (4.95)	6.46 (4.82)	7.61 (5.67)
BSFC KG/KW HR (LB/HP HR)	.375 (.617)	.314 (.516)	.244 (.401)	.307 (.505)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.89 (23.99)	
BSHC G/KW HR (G/HP HR)	.51 (.38)	
BSCO G/KW HR (G/HP HR)	2.96 (2.20)	
BSCO2 G/KW HR (G/HP HR)	890. (664.)	
BSNOX G/KW HR (G/HP HR)	6.77 (5.05)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.280 (.460)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.942 (33.28)
MULTIPLIER FOR	G/TEST	1.243
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0695 (.0518)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2485 (.1127)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.58 (2846.2)

TABLE C-5B (CONT'D). TEST D13-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D13 — TEST NO.D13-2 RUN 1
ENGINE MODEL 79 CAT 3406 PCTA — DATE 3/24/80
ENGINE 14.6 L(893. CID) I-6 — TIME — DIESEL EM-408-F
CVS NO. 10 — DYNO NO. 5 — BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG) — RELATIVE HUMIDITY 44. PCT
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F) — ABSOLUTE HUMIDITY 8.9 GM/KG(62.4 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	802.6 (31.6)	802.6 (31.6)	802.6 (31.6)	802.6 (31.6)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179.	6262.	6382.	6198.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	289.2 (10214.)	293.1 (10351.)	298.7 (10550.)	290.1 (10246.)
HC SAMPLE METER/RANGE/PPM	19.4/11/ 19.	22.9/11/ 23.	25.5/11/ 25.	29.6/11/ 30.
HC BCKGRD METER/RANGE/PPM	5.7/ 1/ 6.	5.3/ 1/ 5.	6.0/ 1/ 6.	6.2/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	63.5/13/ 62.	31.0/13/ 28.	31.7/13/ 29.	39.3/13/ 36.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.2/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	26.5/ 3/ .43	35.9/ 3/ .60	82.6/ 3/ 1.52	25.3/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.8/ 3/ .04	2.4/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	29.1/ 2/ 29.	41.4/ 2/ 41.	41.4/ 3/ 124.	28.2/ 2/ 28.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.7/ 2/ 1.	.1/ 3/ 0.	.8/ 2/ 1.
DILUTION FACTOR	30.33	22.07	8.76	31.96
HC CONCENTRATION PPM	14.	18.	20.	24.
CO CONCENTRATION PPM	60.	27.	27.	35.
CO2 CONCENTRATION PCT	.40	.56	1.49	.37
NOX CONCENTRATION PPM	28.3	40.7	123.9	27.4
HC MASS GRAMS	2.32	3.02	3.48	3.95
CO MASS GRAMS	20.23	9.31	9.55	11.91
CO2 MASS GRAMS	2101.8	3012.5	8156.7	1972.7
NOX MASS GRAMS	15.67	22.84	70.81	15.22
FUEL KG (LB)	.668 (1.47)	.947 (2.09)	2.553 (5.63)	.625 (1.38)
KW HR (HP HR)	2.09 (2.81)	3.32 (4.46)	10.38 (13.92)	2.06 (2.76)
BSHC G/KW HR (G/HP HR)	1.11 (.83)	.91 (.68)	.33 (.25)	1.92 (1.43)
BSCO G/KW HR (G/HP HR)	9.67 (7.21)	2.80 (2.09)	.92 (.69)	5.79 (4.31)
BSCO2 G/KW HR (G/HP HR)	1004.02 (748.70)	906.07 (675.65)	785.89 (586.09)	958.47 (714.73)
BSNOX G/KW HR (G/HP HR)	7.49 (5.58)	6.87 (5.12)	6.82 (5.09)	7.39 (5.51)
BSFC KG/KW HR (LB/HP HR)	.319 (.525)	.285 (.468)	.246 (.404)	.304 (.499)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	17.86 (23.94)	
BSHC G/KW HR (G/HP HR)	.71 (.53)	
BSCO G/KW HR (G/HP HR)	2.86 (2.13)	
BSCO2 G/KW HR (G/HP HR)	854. (637.)	
BSNOX G/KW HR (G/HP HR)	6.97 (5.20)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.268 (.441)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.940 (33.20)
MULTIPLIER FOR	G/TEST	1.246
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0698 (.0520)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2599 (.1179)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.62 (2847.3)

TABLE C-6A. TEST D14-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5099-001

ENGINE NO. D19
ENGINE MODEL 79 CUMMINS NTC-350
ENGINE 14.0 L(855. CID) I-6
CVS NO. 10

TEST NO.D19-2 RUN
DATE 9/ 3/80
TIME 2107
DYNO NO. 5

DIESEL EM-908-F
BAG CART NO. 1

BAROMETER 740.16 MM HG(29.19 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 53. PCT
ABSOLUTE HUMIDITY 9.7 GM/KG(68.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)	795.0 (31.3)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6177.	6261.	6371.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	288.1 (10177.)	292.0 (10315.)	297.2 (10496.)	289.1 (10209.)
HC SAMPLE METER/RANGE/PPM	21.9/11/ 22.	23.8/11/ 24.	29.2/11/ 29.	25.7/11/ 26.
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5.	5.2/ 1/ 5.	6.1/ 1/ 6.	5.8/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	39.9/13/ 32.	28.8/13/ 26.	31.3/13/ 28.	23.2/13/ 21.
CO BCKGRD METER/RANGE/PPM	.7/13/ 1.	.9/13/ 0.	.9/13/ 0.	.3/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	23.6/ 3/ .38	30.7/ 3/ .51	71.5/ 3/ 1.24	20.9/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	3.9/ 3/ .05	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	25.2/ 2/ 25.	35.9/ 2/ 35.	95.7/ 3/ 137.	25.6/ 2/ 26.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.7/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	39.98	26.12	10.30	39.23
HC CONCENTRATION PPM	17.	19.	29.	20.
CO CONCENTRATION PPM	31.	25.	27.	20.
CO2 CONCENTRATION PCT	.39	.47	1.25	.29
NOX CONCENTRATION PPM	29.6	39.7	136.8	25.0
HC MASS GRAMS	2.81	3.17	9.07	3.39
CO MASS GRAMS	10.29	8.99	9.30	6.73
CO2 MASS GRAMS	1803.2	2513.3	6290.9	1596.9
NOX MASS GRAMS	13.57	14.90	77.78	13.83
FUEL KG (LB)	.570 (1.26)	.791 (1.74)	2.127 (4.69)	.489 (1.08)
KW HR (HP HR)	1.99 (1.93)	2.93 (3.26)	9.20 (12.34)	1.50 (2.01)
BSHC G/KW HR (G/HP HR)	1.95 (1.45)	1.30 (.97)	.99 (.33)	2.23 (1.67)
BSCO G/KW HR (G/HP HR)	7.10 (5.29)	3.50 (2.61)	1.01 (.75)	4.50 (3.36)
BSCO2 G/KW HR (G/HP HR)	1250.03 (932.15)	1035.30 (772.02)	738.06 (550.37)	1034.50 (771.43)
BSNOX G/KW HR (G/HP HR)	9.41 (7.01)	7.99 (5.96)	8.95 (6.30)	9.25 (6.90)
BSFC KG/KW HR (LB/HP HR)	.395 (.650)	.326 (.536)	.231 (.380)	.327 (.538)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.53 (19.53)
BSHC G/KW HR (G/HP HR)	.92 (.69)
BSCO G/KW HR (G/HP HR)	2.39 (1.78)
BSCO2 G/KW HR (G/HP HR)	869. (648.)
BSNOX G/KW HR (G/HP HR)	8.55 (6.38)(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.273 (.449)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.845 (29.86)
MULTIPLIER FOR	G/TEST	1.380
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0992 (.0706)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3468 (.1573)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.19 (2795.2)

TABLE C-6A (CONT'D). TEST D14-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D14
ENGINE MODEL 79 CUMMINS NTC-350
ENGINE 14.0 L(855. CID) I-6
CVS NO. 10

TEST NO.D14-3 RUN
DATE 9/ 9/80
TIME 02139
DYNO NO. 5

DIESEL EM-908-F
BAG CART NO. 1

BAROMETER 746.76 MM HG(29.40 IN HG)
DRY BULB TEMP. 24.9 DEG C(76.8 DEG F)

RELATIVE HUMIDITY 52. PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H20(IN. H20)	693.9 (27.3)	693.9 (27.3)	693.9 (27.3)	693.9 (27.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6176.	6260.	6377.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	290.9 (10258.)	294.9 (10398.)	299.9 (10592.)	291.9 (10293.)
HC SAMPLE METER/RANGE/PPM	20.2/11/ 20.	23.3/11/ 23.	25.9/11/ 25.	21.2/11/ 21.
HC BCKGRD METER/RANGE/PPM	4.8/ 1/ 5.	4.9/ 1/ 4.	4.2/ 1/ 4.	4.1/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	33.6/13/ 31.	26.5/13/ 29.	26.3/13/ 29.	20.5/13/ 18.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	20.8/ 3/ .34	29.3/ 3/ .98	70.1/ 3/ 1.27	20.6/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	25.2/ 2/ 25.	90.7/ 2/ 91.	99.5/ 3/ 199.	26.7/ 2/ 27.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.5/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	39.38	27.97	10.59	39.91
HC CONCENTRATION PPM	14.	19.	22.	17.
CO CONCENTRATION PPM	30.	23.	23.	18.
CO2 CONCENTRATION PCT	.30	.95	1.23	.29
NOX CONCENTRATION PPM	24.6	90.2	198.2	26.1
HC MASS GRAMS	2.60	3.23	3.73	2.89
CO MASS GRAMS	10.08	7.92	7.89	6.02
CO2 MASS GRAMS	1593.1	2919.7	6771.8	1556.3
NOX MASS GRAMS	13.68	22.65	85.03	14.56
FUEL KG (LB)	.505 (1.11)	.760 (1.68)	2.120 (4.67)	.991 (1.08)
KW HR (HP HR)	1.57 (2.10)	2.55 (3.42)	9.41 (12.62)	1.51 (2.03)
BSHC G/KW HR (G/HP HR)	1.66 (1.24)	1.27 (.95)	.40 (.30)	1.91 (1.42)
BSCO G/KW HR (G/HP HR)	6.44 (4.80)	3.11 (2.32)	.84 (.62)	3.98 (2.97)
BSCO2 G/KW HR (G/HP HR)	1017.56 (758.80)	946.65 (705.92)	719.54 (536.56)	1028.68 (767.09)
BSNOX G/KW HR (G/HP HR)	8.74 (6.51)	8.88 (6.62)	9.04 (6.74)	9.62 (7.18)
BSFC KG/KW HR (LB/HP HR)	.322 (.480)	.298 (.444)	.225 (.336)	.325 (.484)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.08 (20.17)	
BSHC G/KW HR (G/HP HR)	.83 (.62)	
BSCO G/KW HR (G/HP HR)	2.12 (1.58)	
BSCO2 G/KW HR (G/HP HR)	820. (612.)	
BSNOX G/KW HR (G/HP HR)	9.08 (6.79)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.258 (.424)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.917 (32.39)
MULTIPLIER FOR	G/TEST	1.282
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0853 (.0636)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3308 (.1500)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.97 (2829.7)

TABLE C-GB. TEST D14-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D14
ENGINE MODEL 29 CUMMINS NTC-350
ENGINE 14.0 L(855. CID) I-6
CVS NO. 10

TEST NO.D14-3 RUN
DATE 9/ 9/80
TIME 01:20
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 737.01 MM HG(29.41 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 53. PCT
ABSOLUTE HUMIDITY 9.5 GM/KG(66.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	810.3 (31.9)	810.3 (31.9)	810.3 (31.9)	810.3 (31.9)
BLOWER INLET P MM. H2O(IN. H2O)	693.9 (27.3)	693.9 (27.3)	693.9 (27.3)	693.9 (27.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6176.	6261.	6382.	6196.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METERS(SCF)	290.5 (10260.)	294.5 (10401.)	300.2 (10602.)	291.4 (10293.)
HC SAMPLE METER/RANGE/PPM	26.1/11/ 26.	25.2/11/ 25.	30.0/11/ 30.	25.1/11/ 25.
HC BCKGRD METER/RANGE/PPM	5.0/ 1/ 5.	6.1/ 1/ 6.	7.2/ 1/ 7.	6.6/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	36.2/13/ 33.	26.1/13/ 23.	29.9/13/ 27.	21.9/13/ 19.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	29.5/ 3/ .90	31.3/ 3/ .52	79.7/ 3/ 1.36	20.6/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .09	2.9/ 3/ .09	2.9/ 3/ .09	2.8/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	25.3/ 2/ 25.	34.8/ 2/ 35.	99.2/ 3/ 198.	25.0/ 2/ 25.
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 0.	.9/ 2/ 0.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	33.11	25.59	9.81	39.86
HC CONCENTRATION PPM	21.	19.	24.	19.
CO CONCENTRATION PPM	32.	23.	25.	19.
CO2 CONCENTRATION PCT	.36	.48	1.32	.29
NOX CONCENTRATION PPM	24.9	34.4	197.3	24.4
HC MASS GRAMS	3.56	3.28	4.08	3.13
CO MASS GRAMS	10.41	7.79	8.86	6.29
CO2 MASS GRAMS	1909.2	2568.5	7258.8	1548.2
NOX MASS GRAMS	13.84	14.39	84.60	13.61
FUEL KG (LB)	.605 (1.33)	.808 (1.78)	2.273 (5.01)	.489 (1.08)
KW HR (HP HR)	1.44 (1.93)	2.39 (3.21)	9.46 (12.69)	1.51 (2.03)
BSHC G/KW HR (G/HP HR)	2.47 (1.84)	1.37 (1.02)	.43 (.32)	2.07 (1.54)
BSCO G/KW HR (G/HP HR)	7.56 (5.64)	3.26 (2.43)	.94 (.70)	4.16 (3.10)
BSCO2 G/KW HR (G/HP HR)	1323.51 (986.94)	1073.58 (800.57)	766.98 (571.94)	1023.38 (763.14)
BSNOX G/KW HR (G/HP HR)	9.60 (7.16)	8.10 (6.04)	8.94 (6.67)	9.00 (6.71)
BSFC KG/KW HR (LB/HP HR)	.419 (.689)	.338 (.556)	.240 (.395)	.323 (.532)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.81 (19.86)
BSHC G/KW HR (G/HP HR)	.95 (.71)
BSCO G/KW HR (G/HP HR)	2.29 (1.70)
BSCO2 G/KW HR (G/HP HR)	897. (669.)
BSNOX G/KW HR (G/HP HR)	8.82 (6.62) (from bag readings)
BSFC KG/KW HR (LB/HP HR)	.282 (.463)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.913 (32.23)
MULTIPLIER FOR	G/TEST	1.289
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0870 (.0649)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3088 (.1401)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.86 (2820.5)

TABLE C-6B (CONT'D). TEST D14-3 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D19 — TEST NO.D14-3 RUN
ENGINE MODEL 79 CUMMINS NTC-350 — DATE 4/ 9/80
ENGINE 14.0 L(855. CID) I-6 — TIME 0230 — DIESEL EM-408-F
CVS NO. 10 — DYNO NO. 5 — BAG CART NO. 1

BAROMETER 747.01 MM HG(29.41 IN HG) — RELATIVE HUMIDITY 52. PCT
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F) — ABSOLUTE HUMIDITY 10.1 GM/KG(70.8 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H2O(IN. H2O)	693.9 (27.3)	693.9 (27.3)	693.9 (27.3)	693.9 (27.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6177.	6260.	6376.	6196.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	290.6 (10265.)	294.5 (10403.)	300.0 (10595.)	291.5 (10296.)
HC SAMPLE METER/RANGE/PPM	20.7/11/ 21.	24.3/11/ 24.	25.3/11/ 25.	20.9/11/ 21.
HC BCKGND METER/RANGE/PPM	5.5/ 1/ 6.	5.4/ 1/ 5.	5.3/ 1/ 5.	4.9/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	34.2/13/ 31.	25.5/13/ 23.	26.9/13/ 24.	19.3/13/ 17.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	21.0/ 3/ .34	29.4/ 3/ .48	72.7/ 3/ 1.32	19.8/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.8/ 3/ .04	3.0/ 3/ .05	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	25.2/ 2/ 25.	39.6/ 2/ 40.	53.2/ 3/ 160.	26.6/ 2/ 26.
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0.	.4/ 2/ 0.	.1/ 3/ 0.	.5/ 2/ 1.
DILUTION FACTOR	38.98	27.37	10.12	41.61
HC CONCENTRATION PPM	15.	19.	20.	16.
CO CONCENTRATION PPM	30.	22.	23.	17.
CO2 CONCENTRATION PCT	.30	.44	1.28	.28
NOX CONCENTRATION PPM	24.8	39.2	159.3	25.0
HC MASS GRAMS	2.57	3.25	3.54	2.72
CO MASS GRAMS	10.28	7.61	8.03	5.65
CO2 MASS GRAMS	1572.4	2393.3	7020.4	1991.9
NOX MASS GRAMS	13.79	22.09	91.93	13.95
FUEL KG (LB)	.498 (1.10)	.759 (1.66)	2.198 (4.85)	.471 (1.04)
KW HR (HP HR)	1.57 (2.10)	2.53 (3.40)	9.39 (12.60)	1.55 (2.08)
BSHC G/KW HR (G/HP HR)	1.64 (1.22)	1.28 (.96)	.38 (.28)	1.76 (1.31)
BSCO G/KW HR (G/HP HR)	6.57 (4.90)	3.01 (2.24)	.86 (.64)	3.65 (2.72)
BSCO2 G/KW HR (G/HP HR)	1009.29 (798.90)	999.80 (709.54)	747.35 (557.30)	963.75 (718.67)
BSNOX G/KW HR (G/HP HR)	8.81 (6.57)	8.72 (6.50)	9.73 (7.26)	9.01 (6.72)
BSFC KG/KW HR (LB/HP HR)	.318 (.523)	.298 (.489)	.234 (.385)	.304 (.500)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.09 (20.17)	
BSHC G/KW HR (G/HP HR)	.80 (.60)	
BSCO G/KW HR (G/HP HR)	2.10 (1.57)	
BSCO2 G/KW HR (G/HP HR)	830. (619.)	
BSNOX G/KW HR (G/HP HR)	9.39 (7.00)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.261 (.429)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.911 (32.17)
MULTIPLIER FOR	G/TEST	1.292
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0859 (.0640)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3295 (.1495)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.09 (2828.9)

TABLE C-7A. TEST D15-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D15 — TEST NO.D15-1 RUN
ENGINE MODEL 79 IH DT-466 — DATE 9/16/80
ENGINE 7.6 L(466. CID) I-6 — TIME — DIESEL EM-408-F
CVS NO. 10 — DYNO NO. 5 — BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG) — RELATIVE HUMIDITY 58. PCT
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F) — ABSOLUTE HUMIDITY 10.2 GM/KG(71.1 GRAINS/LB) — NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)
BLOWER INLET P MM. H2O(IN. H2O)	238.8 (9.4)	238.8 (9.4)	238.8 (9.4)	238.8 (9.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	3325.	3369.	3927.	3336.
TIME SECONDS	296.0	299.8	305.0	298.9
TOTAL FLOW STD. CU. METRES(SCF)	176.9 (6229.)	178.7 (6312.)	181.8 (6420.)	177.0 (6252.)
HC SAMPLE METER/RANGE/PPM	35.0/11/ 35.	32.1/11/ 32.	39.5/11/ 39.	26.2/11/ 26.
HC BCKGRD METER/RANGE/PPM	4.8/ 1/ 5.	4.8/ 1/ 5.	4.8/ 1/ 5.	4.8/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	55.8/13/ 53.	42.0/13/ 39.	33.5/13/ 31.	28.8/13/ 26.
CO BCKGRD METER/RANGE/PPM	.2/13/ 0.	.9/13/ 0.	.2/13/ 0.	.9/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	25.7/ 3/ .92	39.2/ 3/ 1.57	74.8/ 3/ 1.36	21.0/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	2.9/ 3/ .09	2.9/ 3/ .09	2.5/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	33.5/ 2/ 34.	42.3/ 2/ 42.	36.1/ 3/ 108.	27.2/ 2/ 27.
NOX BCKGRD METER/RANGE/PPM	1.3/ 2/ 1.	1.0/ 2/ 1.	.2/ 3/ 1.	.9/ 2/ 1.
DILUTION FACTOR	31.27	23.18	9.79	38.97
HC CONCENTRATION PPM	30.	27.	35.	22.
CO CONCENTRATION PPM	52.	38.	29.	25.
CO2 CONCENTRATION PCT	.37	.59	1.32	.30
NOX CONCENTRATION PPM	32.2	41.3	107.8	26.3
HC MASS GRAMS	3.09	2.83	3.69	2.20
CO MASS GRAMS	10.64	7.81	6.15	5.17
CO2 MASS GRAMS	1197.9	1759.5	4402.8	977.1
NOX MASS GRAMS	10.88	14.13	37.42	8.91
FUEL KG (LB)	.382 (.84)	.559 (1.22)	1.380 (3.04)	.310 (.68)
KW HR (HP HR)	.99 (1.32)	1.57 (2.10)	5.31 (7.12)	.93 (1.25)
BSHC G/KW HR (G/HP HR)	3.14 (2.34)	1.81 (1.35)	.69 (.52)	2.36 (1.76)
BSCO G/KW HR (G/HP HR)	10.80 (8.05)	4.99 (3.72)	1.16 (.86)	5.59 (4.13)
BSCO2 G/KW HR (G/HP HR)	1216.00 (906.77)	1120.63 (835.65)	828.79 (617.99)	1048.06 (781.59)
BSNOX G/KW HR (G/HP HR)	11.04 (8.23)	9.03 (6.73)	7.05 (5.26)	9.56 (7.13)
BSFC KG/KW HR (LB/HP HR)	.388 (.638)	.359 (.582)	.260 (.427)	.332 (.546)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.80 (11.80)
BSHC G/KW HR (G/HP HR)	1.34 (1.00)
BSCO G/KW HR (G/HP HR)	3.38 (2.52)
BSCO2 G/KW HR (G/HP HR)	947. (706.)
BSNOX G/KW HR (G/HP HR)	8.12 (6.05)(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.299 (.491)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.870 (30.74)
MULTIPLIER FOR	G/TEST	.820
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0932 (.0695)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3123 (.1417)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.67 (2884.7)

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TABLE C-7A (CONT'D). TEST D15-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 015
ENGINE MODEL 79 IH DT-466
ENGINE 7.6 L(466. CID) I-6
CVS NO. 10

TEST NO.D15-1 RUN
DATE 9/16/80
TIME 0211O
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 50. PCT
ABSOLUTE HUMIDITY 10.2 GM/KG(71.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)	276.9 (10.9)
BLOWER INLET P MM. H2O(IN. H2O)	231.1 (9.1)	231.1 (9.1)	231.1 (9.1)	231.1 (9.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3324.	3368.	3427.	3336.
TIME SECONDS	295.7	299.7	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	176.7 (6242.)	179.1 (6329.)	182.2 (6435.)	177.4 (6269.)
HC SAMPLE METER/RANGE/PPM	21.2/11/ 21.	26.7/11/ 27.	36.8/11/ 37.	25.1/11/ 25.
HC BCKGRD METER/RANGE/PPM	4.8/ 1/ 5.	4.4/ 1/ 4.	4.1/ 1/ 4.	3.9/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	33.0/13/ 30.	32.4/13/ 29.	32.8/13/ 30.	30.3/13/ 27.
CO BCKGRD METER/RANGE/PPM	.3/13/ 0.	.2/13/ 0.	.4/13/ 0.	.3/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.5/ 3/ .36	31.4/ 3/ .53	74.5/ 3/ 1.36	22.1/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.4/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	27.4/ 2/ 28.	37.5/ 2/ 38.	35.2/ 3/ 106.	27.6/ 2/ 28.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.8/ 2/ 1.	.1/ 3/ 0.	.9/ 2/ 1.
DILUTION FACTOR	36.28	25.04	9.83	36.95
HC CONCENTRATION PPM	17.	22.	33.	21.
CO CONCENTRATION PPM	29.	29.	28.	27.
CO2 CONCENTRATION PCT	.32	.49	1.32	.32
NOX CONCENTRATION PPM	27.2	36.7	105.3	26.7
HC MASS GRAMS	1.68	2.32	3.48	2.18
CO MASS GRAMS	5.99	5.99	6.00	5.48
CO2 MASS GRAMS	1099.9	1611.7	4392.1	1025.8
NOX MASS GRAMS	9.20	12.58	36.71	9.07
FUEL KG (LB)	.330 (.73)	.508 (1.12)	1.377 (3.04)	.325 (.72)
KW HR (HP HR)	.95 (1.27)	1.58 (2.12)	5.31 (7.12)	.93 (1.25)
BSHC G/KW HR (G/HP HR)	1.77 (1.32)	1.47 (1.09)	.65 (.49)	2.33 (1.74)
BSCO G/KW HR (G/HP HR)	6.30 (4.70)	3.75 (2.80)	1.13 (.84)	5.88 (4.39)
BSCO2 G/KW HR (G/HP HR)	1099.40 (819.83)	1017.97 (759.10)	826.74 (616.50)	1100.21 (820.42)
BSNOX G/KW HR (G/HP HR)	9.69 (7.22)	7.95 (5.93)	6.91 (5.15)	9.72 (7.25)
BSFC KG/KW HR (LB/HP HR)	.348 (.572)	.321 (.528)	.259 (.426)	.348 (.573)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.78 (11.77)	
BSHC G/KW HR (G/HP HR)	1.10 (.82)	
BSCO G/KW HR (G/HP HR)	2.67 (1.99)	
BSCO2 G/KW HR (G/HP HR)	920. (686.)	
BSNOX G/KW HR (G/HP HR)	7.20 (5.37)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.289 (.476)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.911 (32.19)
MULTIPLIER FOR	G/TEST	.785
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0899 (.0667)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3090 (.1402)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.81 (2889.4)

TABLE C-7B. TEST D15-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D15
ENGINE MODEL 79 IH DT-466
ENGINE 7.6 L(466. CID) I-6
CVS NO. 10

TEST NO. D15-2 RUN
DATE 4/17/80
TIME 8:57
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 746.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 54. PCT
ABSOLUTE HUMIDITY 11.2 GM/KG(78.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)
BLOWER INLET P MM. H2O(IN. H2O)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	3329.	3368.	3927.	3335.
TIME SECONDS	295.9	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	177.5 (6271.)	179.9 (6359.)	183.0 (6465.)	178.1 (6292.)
HC SAMPLE METER/RANGE/PPM	35.9/11/ 36.	32.7/11/ 33.	39.4/11/ 39.	26.2/11/ 26.
HC BCKGRD METER/RANGE/PPM	4.2/ 1/ 4.	3.9/ 1/ 4.	3.9/ 1/ 4.	3.8/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	58.5/13/ 56.	43.3/13/ 40.	35.0/13/ 32.	30.1/13/ 27.
CO BCKGRD METER/RANGE/PPM	.4/13/ 0.	.1/13/ 0.	.3/13/ 0.	.4/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	25.8/ 3/ .92	34.9/ 3/ .58	75.4/ 3/ 1.37	21.8/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	32.0/ 2/ 32.	42.0/ 2/ 42.	34.9/ 3/ 105.	26.8/ 2/ 27.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.8/ 2/ 1.	.1/ 3/ 0.	.8/ 2/ 1.
DILUTION FACTOR	31.12	22.67	9.70	37.47
HC CONCENTRATION PPM	32.	29.	36.	23.
CO CONCENTRATION PPM	54.	39.	30.	26.
CO2 CONCENTRATION PCT	.38	.54	1.33	.31
NOX CONCENTRATION PPM	31.2	41.2	109.4	26.0
HC MASS GRAMS	3.26	3.01	3.79	2.32
CO MASS GRAMS	11.24	8.17	6.47	5.44
CO2 MASS GRAMS	1250.4	1788.9	4474.9	1008.5
NOX MASS GRAMS	10.61	14.19	36.57	8.87
FUEL KG (LB)	.399 (.88)	.565 (1.25)	1.403 (3.09)	.320 (.70)
KW HR (HP HR)	.95 (1.27)	1.60 (2.15)	5.40 (7.24)	.95 (1.27)
BSHC G/KW HR (G/HP HR)	3.43 (2.56)	1.88 (1.40)	.70 (.52)	2.44 (1.82)
BSCO G/KW HR (G/HP HR)	11.83 (8.82)	5.10 (3.81)	1.20 (.89)	5.73 (4.27)
BSCO2 G/KW HR (G/HP HR)	1316.34 (981.60)	1117.97 (833.30)	828.60 (617.89)	1061.70 (791.71)
BSNOX G/KW HR (G/HP HR)	11.16 (8.33)	8.86 (6.61)	6.77 (5.05)	9.33 (6.96)
BSFC KG/KW HR (LB/HP HR)	.420 (.690)	.353 (.580)	.260 (.427)	.336 (.553)

TOTAL TEST RESULTS 4 BAGS

PARTICULATE DATA, TOTAL FOR 4 BAGS

TOTAL KW HR (HP HR)	8.90 (11.94)	
BSHC G/KW HR (G/HP HR)	1.39 (1.04)	
BSCO G/KW HR (G/HP HR)	3.52 (2.62)	
BSCO2 G/KW HR (G/HP HR)	957. (714.)	
BSNOX G/KW HR (G/HP HR)	7.89 (5.88)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.302 (.496)	

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.906 (31.99)
MULTIPLIER FOR	G/TEST	.793
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0891 (.0665)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2953 (.1339)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.09 (2899.6)

TABLE C-7B (CONT'D). TEST D15-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D15
ENGINE MODEL 79 IH DT-466
ENGINE 7.6 L(466. CID) I-6
CVS NO. 10

TEST NO.D15-2 RUN
DATE 4/17/80
TIME 9:36
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 246.25 MM HG(29.38 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 51. PCT
ABSOLUTE HUMIDITY 10.6 GM/KG(74.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)	287.0 (11.3)
BLOWER INLET P MM. H20(IN. H20)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)	246.4 (9.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	3325.	3368.	3927.	3332.
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	177.4 (6266.)	179.7 (6348.)	182.9 (6459.)	177.8 (6280.)
HC SAMPLE METER/RANGE/PPM	20.8/11/ 21.	26.6/11/ 27.	37.2/11/ 37.	25.3/11/ 25.
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5.	5.0/ 1/ 5.	4.7/ 1/ 5.	4.5/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	29.6/13/ 27.	34.6/13/ 32.	34.8/13/ 32.	29.9/13/ 27.
CO BCKGRD METER/RANGE/PPM	.4/13/ 0.	.1/13/ 0.	.4/13/ 0.	.4/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.3/ 3/ .36	32.3/ 3/ .54	75.5/ 3/ 1.38	21.5/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	26.9/ 2/ 27.	36.8/ 2/ 37.	33.6/ 3/ 101.	26.6/ 2/ 27.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.6/ 2/ 1.	.2/ 3/ 1.	.9/ 2/ 1.
DILUTION FACTOR	36.65	29.70	9.69	38.03
HC CONCENTRATION PPM	16.	22.	33.	21.
CO CONCENTRATION PPM	26.	31.	30.	26.
CO2 CONCENTRATION PCT	.32	.50	1.34	.31
NOX CONCENTRATION PPM	26.3	36.2	100.3	25.7
HC MASS GRAMS	1.61	2.26	3.47	2.15
CO MASS GRAMS	5.33	6.42	6.41	5.40
CO2 MASS GRAMS	1037.3	1641.9	4481.9	999.8
FUEL KG (LB)	8.93	12.45	35.07	8.75
KW HR (HP HR)	.328 (.72)	.518 (1.14)	1.405 (3.10)	.315 (.69)
	.93 (1.25)	1.58 (2.12)	5.38 (7.22)	.95 (1.27)
BSHC G/KW HR (G/HP HR)	1.73 (1.29)	1.93 (1.06)	.65 (.48)	2.26 (1.69)
BSCO G/KW HR (G/HP HR)	5.72 (4.26)	4.05 (3.02)	1.19 (.89)	5.69 (4.24)
BSCO2 G/KW HR (G/HP HR)	1112.61 (829.67)	1036.73 (773.09)	832.61 (620.88)	1047.20 (780.89)
BSNOX G/KW HR (G/HP HR) (from bag readings)	9.58 (7.14)	7.87 (5.87)	6.52 (4.86)	9.21 (6.87)
BSFC KG/KW HR (LB/HP HR)	.352 (.578)	.327 (.537)	.261 (.429)	.332 (.545)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.85 (11.87)
BSHC G/KW HR (G/HP HR)	1.07 (.80)
BSCO G/KW HR (G/HP HR)	2.66 (1.99)
BSCO2 G/KW HR (G/HP HR)	922. (687.)
BSNOX G/KW HR (G/HP HR)	7.37 (5.50)
BSFC KG/KW HR (LB/HP HR)	.290 (.477)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.916 (32.36)
MULTIPLIER FOR	G/TEST	.783
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0885 (.0660)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3059 (.1385)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.36 (2873.5)

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TABLE C-8A. TEST D16-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D16
ENGINE MODEL 79 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-2 RUN
DATE 4/30/80
TIME 1:43
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 733.04 MM HG(28.86 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 51. PCT
ABSOLUTE HUMIDITY 10.5 GM/KG(73.2 GRAINS/LB) NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	703.6 (27.7)	703.6 (27.7)	703.6 (27.7)
BLOWER INLET P MM. H2O(IN. H2O)	604.5 (23.8)	604.5 (23.8)	604.5 (23.8)	604.5 (23.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	5743.	5820.	5921.	5762.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	268.4 (9480.)	272.0 (9607.)	276.7 (9773.)	269.3 (9511.)
HC SAMPLE METER/RANGE/PPM	17.7/11/ 18.	25.8/11/ 26.	45.7/11/ 46.	25.8/11/ 26.
HC BCKGRD METER/RANGE/PPM	5.2/ 1/ 5.	5.2/ 1/ 5.	5.2/ 1/ 5.	5.1/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	31.0/13/ 28.	30.1/13/ 27.	39.2/13/ 36.	58.0/13/ 56.
CO BCKGRD METER/RANGE/PPM	.2/13/ 0.	.1/13/ 0.	.1/13/ 0.	.6/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	25.0/ 3/ .41	33.2/ 3/ .55	75.0/ 3/ 1.37	23.4/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.7/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	38.8/ 2/ 39.	55.6/ 2/ 56.	54.1/ 3/ 162.	45.4/ 2/ 45.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.3/ 2/ 0.	.1/ 3/ 0.	.7/ 2/ 1.
DILUTION FACTOR	32.52	24.00	9.75	34.55
HC CONCENTRATION PPM	13.	21.	41.	21.
CO CONCENTRATION PPM	27.	26.	34.	54.
CO2 CONCENTRATION PCT	.37	.51	1.33	.34
NOX CONCENTRATION PPM	38.3	55.3	162.0	44.7
HC MASS GRAMS	1.96	3.26	6.56	3.24
CO MASS GRAMS	8.52	8.37	11.12	16.86
CO2 MASS GRAMS	1806.8	2557.9	6729.9	1668.2
NOX MASS GRAMS	19.67	28.78	85.77	23.04
FUEL KG (LB)	.570 (1.26)	.805 (1.78)	2.112 (4.66)	.532 (1.17)
KW HR (HP HR)	1.67 (2.24)	2.64 (3.54)	8.69 (11.65)	1.64 (2.19)
BSHC G/KW HR (G/HP HR)	1.17 (.88)	1.24 (.92)	.75 (.56)	1.98 (1.48)
BSCO G/KW HR (G/HP HR)	5.10 (3.80)	3.17 (2.36)	1.28 (.95)	10.31 (7.69)
BSCO2 G/KW HR (G/HP HR)	1081.15 (806.20)	969.37 (722.86)	774.43 (577.49)	1019.68 (760.38)
BSNOX G/KW HR (G/HP HR)	11.77 (8.78)	10.91 (8.13)	9.87 (7.36)	14.08 (10.50)
BSFC KG/KW HR (LB/HP HR)	.341 (.561)	.305 (.502)	.243 (.399)	.325 (.535)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.64 (19.63)
BSHC G/KW HR (G/HP HR)	1.03 (.77)
BSCO G/KW HR (G/HP HR)	3.07 (2.29)
BSCO2 G/KW HR (G/HP HR)	872. (650.)
BSNOX G/KW HR (G/HP HR)	10.74 (8.01)(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.275 (.451)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.910 (32.14)
MULTIPLIER FOR	G/TEST	1.194
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0816 (.0608)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2970 (.1347)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	82.40 (2910.5)

TABLE C-8A (CONT'D). TEST D16-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D16
ENGINE MODEL 79 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-2 RUN
DATE 4/30/80
TIME 2:21
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 733.04 MM HG(28.86 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 47. PCT
ABSOLUTE HUMIDITY 9.6 GM/KG(67.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	706.1 (27.8)	706.1 (27.8)	706.1 (27.8)	706.1 (27.8)
BLOWER INLET P MM. H2O(IN. H2O)	604.5 (23.8)	604.5 (23.8)	604.5 (23.8)	604.5 (23.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	5744.	5822.	5922.	5763.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	268.3 (9476.)	271.9 (9605.)	276.6 (9769.)	269.2 (9507.)
HC SAMPLE METER/RANGE/PPM	25.8/11/ 26.	28.1/11/ 28.	45.7/11/ 46.	25.1/11/ 25.
HC BCKGRD METER/RANGE/PPM	4.9/ 1/ 5.	4.9/ 1/ 5.	4.9/ 1/ 5.	4.9/ 1/ 5.
CO SAMPLE METER/RANGE/PPM	71.5/13/ 70.	43.3/13/ 40.	39.7/13/ 37.	60.8/13/ 59.
CO BCKGRD METER/RANGE/PPM	.8/13/ 1.	.6/13/ 1.	.3/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	23.5/ 3/ .38	32.4/ 3/ .54	75.0/ 3/ 1.37	23.6/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	42.2/ 2/ 42.	58.1/ 2/ 58.	51.0/ 3/ 153.	43.7/ 2/ 44.
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0.	.1/ 2/ 0.	.3/ 3/ 1.	.5/ 2/ 1.
DILUTION FACTOR	34.27	24.57	9.75	34.22
HC CONCENTRATION PPM	21.	23.	41.	20.
CO CONCENTRATION PPM	68.	39.	35.	57.
CO2 CONCENTRATION PCT	.34	.50	1.33	.34
NOX CONCENTRATION PPM	42.1	58.0	152.2	43.2
HC MASS GRAMS	3.26	3.67	6.59	3.16
CO MASS GRAMS	21.28	12.26	11.23	17.93
CO2 MASS GRAMS	1670.6	2470.5	6720.2	1692.0
NOX MASS GRAMS	21.61	30.17	80.53	22.25
FUEL KG (LB)	.535 (1.18)	.780 (1.72)	2.109 (4.65)	.540 (1.19)
KW HR (HP HR)	1.65 (2.22)	2.69 (3.61)	8.67 (11.63)	1.62 (2.17)
BSHC G/KW HR (G/HP HR)	1.97 (1.47)	1.36 (1.02)	.76 (.57)	1.95 (1.46)
BSCO G/KW HR (G/HP HR)	12.87 (9.60)	4.56 (3.40)	1.30 (.97)	11.08 (8.26)
BSCO2 G/KW HR (G/HP HR)	1010.26 (753.35)	917.89 (684.47)	774.88 (577.83)	1045.47 (779.61)
BSNOX G/KW HR (G/HP HR)	13.07 (9.74)	11.21 (8.36)	9.29 (6.92)	13.75 (10.25)
BSFC KG/KW HR (LB/HP HR)	.323 (.532)	.290 (.477)	.243 (.400)	.334 (.548)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.64 (19.63)	
BSHC G/KW HR (G/HP HR)	1.14 (.85)	
BSCO G/KW HR (G/HP HR)	4.28 (3.19)	
BSCO2 G/KW HR (G/HP HR)	858. (640.)	
BSNOX G/KW HR (G/HP HR)	10.56 (7.87)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.271 (.445)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.920 (32.51)
MULTIPLIER FOR	G/TEST	1.180
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0806 (.0601)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2977 (.1350)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.01 (2755.3)

TABLE C-8B. TEST D16-4 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D16
ENGINE MODEL 79 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-4 RUN
DATE 5/ 3/80
TIME 1:04
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 54. PCT
ABSOLUTE HUMIDITY 10.6 GM/KG(74.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)
BLOWER INLET P MM. H2O(IN. H2O)	614.7 (24.2)	614.7 (24.2)	614.7 (24.2)	614.7 (24.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)
BLOWER REVOLUTIONS	5742.	5821.	5920.	5761.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	271.9 (9603.)	275.6 (9735.)	280.3 (9900.)	272.8 (9634.)
HC SAMPLE METER/RANGE/PPM	18.4/11/ 18.	25.1/11/ 25.	42.6/11/ 43.	26.1/11/ 26.
HC BCKGRD METER/RANGE/PPM	10.1/ 1/ 10.	8.4/ 1/ 8.	7.9/ 1/ 8.	7.7/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	31.5/13/ 29.	29.0/13/ 26.	41.6/13/ 39.	56.1/13/ 54.
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1.	1.1/13/ 1.	.9/13/ 1.	1.5/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	28.1/ 3/ .46	33.7/ 3/ .56	76.7/ 3/ 1.40	23.7/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.7/ 3/ .06	3.3/ 3/ .05	3.3/ 3/ .05	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	38.1/ 2/ 38.	50.9/ 2/ 51.	52.0/ 3/ 156.	43.1/ 2/ 43.
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0.	.4/ 2/ 0.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	28.72	23.63	9.51	34.11
HC CONCENTRATION PPM	9.	17.	36.	19.
CO CONCENTRATION PPM	27.	25.	36.	51.
CO2 CONCENTRATION PCT	.41	.51	1.36	.34
NOX CONCENTRATION PPM	38.0	50.5	155.7	42.5
HC MASS GRAMS	1.36	2.71	5.74	2.94
CO MASS GRAMS	8.52	7.88	11.79	16.20
CO2 MASS GRAMS	2027.3	2592.9	6961.9	1715.8
NOX MASS GRAMS	19.76	26.63	83.50	22.19
FUEL KG (LB)	.638 (1.41)	.816 (1.80)	2.184 (4.81)	.546 (1.20)
KW HR (HP HR)	1.62 (2.17)	2.60 (3.49)	8.71 (11.68)	1.65 (2.22)
BSHC G/KW HR (G/HP HR)	.84 (.63)	1.04 (.78)	.66 (.49)	1.78 (1.32)
BSCO G/KW HR (G/HP HR)	5.27 (3.93)	3.03 (2.26)	1.35 (1.01)	9.79 (7.30)
BSCO2 G/KW HR (G/HP HR)	1252.68 (934.12)	995.93 (742.66)	799.51 (596.19)	1037.62 (773.75)
BSNOX G/KW HR (G/HP HR)	12.21 (9.11)	10.23 (7.63)	9.59 (7.15)	13.42 (10.00)
BSFC KG/KW HR (LB/HP HR)	.394 (.648)	.313 (.515)	.251 (.412)	.330 (.543)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.58 (19.56)	
BSHC G/KW HR (G/HP HR)	.87 (.65)	
BSCO G/KW HR (G/HP HR)	3.04 (2.27)	
BSCO2 G/KW HR (G/HP HR)	912. (680.)	
BSNOX G/KW HR (G/HP HR)	10.43 (7.78)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.287 (.472)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.866 (30.60)
MULTIPLIER FOR	G/TEST	1.270
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0871 (.0650)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3037 (.1377)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.19 (2832.4)

TABLE C-8B (CONT'D). TEST D16-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D16
ENGINE MODEL 79 D.D. 6V-92TA
ENGINE 9.0 L(552. CID) V-6
CVS NO. 10

TEST NO.D16-4 RUN
DATE 5/ 3/80
TIME 1:44
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 740.41 MM HG(29.15 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 10.8 GM/KG(75.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)
BLOWER INLET P MM. H2O(IN. H2O)	617.2 (24.3)	617.2 (24.3)	617.2 (24.3)	617.2 (24.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)	49.4 (121.0)
BLOWER REVOLUTIONS	5742.	5821.	5920.	5762.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	271.4 (9586.)	275.1 (9718.)	279.8 (9883.)	272.3 (9619.)
HC SAMPLE METER/RANGE/PPM	18.9/11/ 19.	24.4/11/ 24.	41.4/11/ 41.	24.0/11/ 24.
HC BCKGRD METER/RANGE/PPM	8.9/ 1/ 9.	7.2/ 1/ 7.	6.3/ 1/ 6.	5.5/ 1/ 6.
CO SAMPLE METER/RANGE/PPM	48.9/13/ 46.	37.4/13/ 34.	36.6/13/ 34.	56.9/13/ 54.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.0/ 3/ .36	31.1/ 3/ .52	74.0/ 3/ 1.35	23.0/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.3/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	39.3/ 2/ 39.	55.7/ 2/ 56.	53.5/ 3/ 161.	43.1/ 2/ 43.
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0.	.1/ 2/ 0.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	37.00	25.72	9.90	35.20
HC CONCENTRATION PPM	10.	18.	36.	19.
CO CONCENTRATION PPM	45.	33.	32.	53.
CO2 CONCENTRATION PCT	.32	.48	1.31	.33
NOX CONCENTRATION PPM	39.2	55.6	160.2	42.5
HC MASS GRAMS	1.61	2.78	5.76	2.93
CO MASS GRAMS	14.15	10.67	10.43	16.80
CO2 MASS GRAMS	1598.4	2426.3	6692.5	1645.1
NOX MASS GRAMS	20.35	29.26	85.76	22.15
FUEL KG (LB)	.507 (1.12)	.765 (1.69)	2.099 (4.63)	.524 (1.16)
KW HR (HP HR)	1.64 (2.19)	2.67 (3.59)	8.71 (11.68)	1.64 (2.19)
BSHC G/KW HR (G/HP HR)	.99 (.74)	1.04 (.77)	.66 (.49)	1.79 (1.34)
BSCO G/KW HR (G/HP HR)	8.65 (6.45)	3.99 (2.98)	1.20 (.89)	10.27 (7.66)
BSCO2 G/KW HR (G/HP HR)	977.00 (728.55)	907.40 (676.65)	758.57 (573.12)	1005.58 (749.86)
BSNOX G/KW HR (G/HP HR)	12.44 (9.28)	10.94 (8.16)	9.85 (7.34)	13.54 (10.10)
BSFC KG/KW HR (LB/HP HR)	.310 (.510)	.286 (.470)	.241 (.396)	.321 (.527)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	14.65 (19.65)
BSHC G/KW HR (G/HP HR)	.89 (.67)
BSCO G/KW HR (G/HP HR)	3.55 (2.65)
BSCO2 G/KW HR (G/HP HR)	844. (629.)
BSNOX G/KW HR (G/HP HR)	10.75 (8.02)(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.266 (.437)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.877 (30.98)
MULTIPLIER FOR	G/TEST	1.253
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0855 (.0637)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3216 (.1459)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.41 (2804.9)

TABLE C-9A. TEST D17-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

TEST NO.D17-1 RUN
DATE 5/ 7/80
TIME 09:13
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 61. PCT
ABSOLUTE HUMIDITY 10.5 GM/KG(73.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	800.1 (31.5)	800.1 (31.5)	800.1 (31.5)	800.1 (31.5)
BLOWER INLET P MM. H2O(IN. H2O)	685.8 (27.0)	685.8 (27.0)	685.8 (27.0)	685.8 (27.0)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6176.	6260.	6370.	6197.
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	288.0 (10174.)	292.0 (10312.)	297.1 (10493.)	289.0 (10208.)
HC SAMPLE METER/RANGE/PPM	4.2/22/ 21.	4.6/22/ 23.	7.3/22/ 36.	4.8/22/ 24.
HC BCKGRD METER/RANGE/PPM	10.0/ 1/ 10.	9.4/ 1/ 9.	8.9/ 1/ 9.	8.0/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	31.0/13/ 28.	24.2/13/ 22.	31.3/13/ 28.	56.7/13/ 54.
CO BCKGRD METER/RANGE/PPM	.9/13/ 1.	.6/13/ 1.	.7/13/ 1.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	24.7/ 3/ .40	32.9/ 3/ .55	77.5/ 3/ 1.42	23.2/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.0/ 3/ .05	3.2/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	29.0/ 2/ 29.	42.8/ 2/ 43.	49.9/ 3/ 150.	36.9/ 2/ 37.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.4/ 2/ 0.	.1/ 3/ 0.	.4/ 2/ 0.
DILUTION FACTOR	32.91	24.27	9.41	34.89
HC CONCENTRATION PPM	11.	14.	28.	16.
CO CONCENTRATION PPM	27.	21.	27.	52.
CO2 CONCENTRATION PCT	.36	.50	1.37	.33
NOX CONCENTRATION PPM	28.4	42.4	149.4	36.5
HC MASS GRAMS	1.90	2.32	4.87	2.71
CO MASS GRAMS	8.92	6.98	9.19	17.61
CO2 MASS GRAMS	1895.7	2692.9	7476.6	1740.4
NOX MASS GRAMS	15.66	23.69	84.92	20.19
FUEL KG (LB)	.598 (1.32)	.846 (1.86)	2.342 (5.16)	.554 (1.22)
KW HR (HP HR)	1.72 (2.31)	2.60 (3.49)	9.27 (12.43)	1.69 (2.26)
BSHC G/KW HR (G/HP HR)	1.10 (.82)	.89 (.67)	.52 (.39)	1.60 (1.19)
BSCO G/KW HR (G/HP HR)	5.17 (3.86)	2.68 (2.00)	.99 (.74)	10.43 (7.78)
BSCO2 G/KW HR (G/HP HR)	1099.60 (819.97)	1034.31 (771.28)	806.48 (601.39)	1030.57 (768.49)
BSNOX G/KW HR (G/HP HR)	9.08 (6.77)	9.10 (6.79)	9.16 (6.83)	11.95 (8.91)
BSFC KG/KW HR (LB/HP HR)	.347 (.570)	.325 (.534)	.253 (.415)	.328 (.540)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.29 (20.50)	
BSHC G/KW HR (G/HP HR)	.77 (.58)	
BSCO G/KW HR (G/HP HR)	2.79 (2.08)	
BSCO2 G/KW HR (G/HP HR)	903. (673.)	
BSNOX G/KW HR (G/HP HR)	9.45 (7.05)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.284 (.467)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.888 (31.36)
MULTIPLIER FOR	G/TEST	1.313
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0859 (.0641)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3026 (.1372)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.31 (2766.1)

TABLE C-9A (CONT'D). TEST D17-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

TEST NO.D17-1 RUN
DATE 5/ 7/80
TIME 09:53
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 60. PCT
ABSOLUTE HUMIDITY 10.7 GM/KG(74.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	302.6 (31.6)	802.6 (31.6)	802.6 (31.6)	802.6 (31.6)
BLOWER INLET P MM. H2O(IN. H2O)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6176.	6261.	6362.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	287.9 (10168.)	291.8 (10308.)	296.5 (10474.)	288.9 (10202.)
HC SAMPLE METER/RANGE/PPM	18.7/11/ 19.	23.1/11/ 23.	36.2/11/ 36.	23.1/11/ 23.
HC BCKGRD METER/RANGE/PPM	9.3/ 1/ 9.	7.6/ 1/ 8.	7.5/ 1/ 8.	7.0/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	50.5/13/ 48.	28.6/13/ 26.	31.7/13/ 29.	58.6/13/ 56.
CO BCKGRD METER/RANGE/PPM	.7/13/ 1.	.7/13/ 1.	.7/13/ 1.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	24.3/ 3/ .40	33.3/ 3/ .55	78.0/ 3/ 1.43	24.2/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .06	2.9/ 3/ .04	3.3/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	34.7/ 2/ 35.	51.1/ 2/ 51.	49.8/ 3/ 149.	38.2/ 2/ 38.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.5/ 2/ 1.	.2/ 3/ 1.	.4/ 2/ 0.
DILUTION FACTOR	33.34	23.94	9.34	33.38
HC CONCENTRATION PPM	10.	16.	29.	16.
CO CONCENTRATION PPM	46.	24.	27.	54.
CO2 CONCENTRATION PCT	.34	.51	1.38	.35
NOX CONCENTRATION PPM	34.1	50.6	148.9	37.8
HC MASS GRAMS	1.60	2.67	5.04	2.72
CO MASS GRAMS	15.35	8.31	9.29	18.27
CO2 MASS GRAMS	1802.5	2738.4	7511.7	1831.2
NOX MASS GRAMS	18.79	28.26	84.45	20.89
FUEL KG (LB)	.572 (1.26)	.861 (1.90)	2.353 (5.19)	.583 (1.29)
KW HR (HP HR)	1.72 (2.31)	2.81 (3.77)	9.24 (12.38)	1.67 (2.24)
BSHC G/KW HR (G/HP HR)	.93 (.69)	.95 (.71)	.55 (.41)	1.63 (1.21)
BSCO G/KW HR (G/HP HR)	8.90 (6.64)	2.95 (2.20)	1.01 (.75)	10.93 (8.15)
BSCO2 G/KW HR (G/HP HR)	1045.55 (779.67)	972.91 (725.50)	813.35 (606.51)	1095.75 (817.10)
BSNOX G/KW HR (G/HP HR)	10.90 (8.13)	10.04 (7.49)	9.14 (6.82)	12.50 (9.32)
BSFC KG/KW HR (LB/HP HR)	.332 (.545)	.306 (.503)	.255 (.419)	.349 (.574)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.45 (20.71)	
BSHC G/KW HR (G/HP HR)	.78 (.58)	
BSCO G/KW HR (G/HP HR)	3.32 (2.47)	
BSCO2 G/KW HR (G/HP HR)	899. (670.)	
BSNOX G/KW HR (G/HP HR)	9.87 (7.36)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.283 (.465)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.901 (31.81)
MULTIPLIER FOR	G/TEST	1.294
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0838 (.0625)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2961 (.1343)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.03 (2755.9)

TABLE C-9B. TEST D17-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

TEST NO.D17-2 RUN
DATE 5/ 9/80
TIME 09:30
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 53. PCT
ABSOLUTE HUMIDITY 10.4 GM/KG(72.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H2O(IN. H2O)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6175.	6260.	6369.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	289.1 (10213.)	293.1 (10353.)	298.2 (10533.)	290.2 (10249.)
HC SAMPLE METER/RANGE/PPM	21.4/11/ 21.	19.4/11/ 19.	32.9/11/ 33.	19.8/11/ 20.
HC BCKGRD METER/RANGE/PPM	5.6/ 1/ 6.	4.6/ 1/ 5.	4.3/ 1/ 4.	4.0/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	29.3/13/ 26.	21.3/13/ 19.	26.9/13/ 24.	52.9/13/ 50.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	23.8/ 3/ .39	32.3/ 3/ .54	76.7/ 3/ 1.40	22.7/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.8/ 3/ .04	3.2/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	28.4/ 2/ 28.	41.9/ 2/ 42.	49.3/ 3/ 148.	35.3/ 2/ 35.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.7/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	34.23	24.79	9.52	35.77
HC CONCENTRATION PPM	16.	15.	29.	16.
CO CONCENTRATION PPM	26.	18.	23.	49.
CO2 CONCENTRATION PCT	.34	.50	1.36	.32
NOX CONCENTRATION PPM	27.9	41.2	147.6	34.7
HC MASS GRAMS	2.66	2.54	5.00	2.66
CO MASS GRAMS	8.67	6.27	8.01	16.51
CO2 MASS GRAMS	1812.1	2661.2	7414.7	1701.4
NOX MASS GRAMS	15.44	23.12	84.22	19.27
FUEL KG (LB)	.572 (1.26)	.836 (1.84)	2.322 (5.12)	.542 (1.19)
KW HR (HP HR)	1.53 (2.05)	2.55 (3.42)	9.27 (12.43)	1.69 (2.26)
BSHC G/KW HR (G/HP HR)	1.74 (1.30)	1.00 (.74)	.54 (.40)	1.58 (1.17)
BSCO G/KW HR (G/HP HR)	5.66 (4.22)	2.46 (1.83)	.86 (.64)	9.78 (7.29)
BSCO2 G/KW HR (G/HP HR)	1134.00 (882.91)	1043.31 (778.00)	799.80 (596.41)	1007.45 (751.26)
BSNOX G/KW HR (G/HP HR)	10.09 (7.52)	9.06 (6.76)	9.08 (6.77)	11.41 (8.51)
BSFC KG/KW HR (LB/HP HR)	.374 (.615)	.328 (.539)	.251 (.412)	.321 (.527)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.04 (20.17)	
BSHC G/KW HR (G/HP HR)	.86 (.64)	
BSCO G/KW HR (G/HP HR)	2.62 (1.96)	
BSCO2 G/KW HR (G/HP HR)	904. (674.)	
BSNOX G/KW HR (G/HP HR)	9.44 (7.04)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.284 (.467)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.868 (30.66)
MULTIPLIER FOR	G/TEST	1.348
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0897 (.0669)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3156 (.1432)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.05 (2792.2)

TABLE C-9B (CONT'D). TEST D17-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO.D17-2 RUN
DATE 5/ 9/80
TIME 10:10
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

RELATIVE HUMIDITY 58. PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

ENGINE NO. D17
ENGINE MODEL 79 D.D. 8V-71TA
ENGINE 9.3 L(568. CID) V-8
CVS NO. 10

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)	807.7 (31.8)
BLOWER INLET P MM. H2O(IN. H2O)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)	688.3 (27.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6176.	6260.	6369.	6197.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	289.0 (10208.)	292.9 (10347.)	298.0 (10527.)	290.0 (10243.)
HC SAMPLE METER/RANGE/PPM	15.8/11/ 16.	20.4/11/ 20.	33.0/11/ 33.	20.1/11/ 20.
HC BCKGRD METER/RANGE/PPM	5.6/ 1/ 6.	5.2/ 1/ 5.	4.8/ 1/ 5.	4.4/ 1/ 4.
CO SAMPLE METER/RANGE/PPM	59.4/13/ 57.	25.3/13/ 23.	27.3/13/ 25.	51.9/13/ 49.
CO BCKGRD METER/RANGE/PPM	.9/13/ 1.	-.1/13/ 0.	-.1/13/ 0.	-.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.1/ 3/ .36	28.9/ 3/ .48	75.4/ 3/ 1.37	21.3/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	2.2/ 3/ .03	2.5/ 3/ .04	2.1/ 3/ .03	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	35.1/ 2/ 35.	45.8/ 2/ 46.	49.7/ 3/ 149.	36.8/ 2/ 37.
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0.	1.4/ 2/ 1.	.3/ 3/ 1.	1.5/ 2/ 2.
DILUTION FACTOR	36.75	27.90	9.71	38.22
HC CONCENTRATION PPM	10.	15.	29.	16.
CO CONCENTRATION PPM	55.	22.	23.	48.
CO2 CONCENTRATION PCT	.32	.44	1.35	.30
NOX CONCENTRATION PPM	54.7	44.5	148.3	35.3
HC MASS GRAMS	1.73	2.61	4.93	2.65
CO MASS GRAMS	18.48	7.50	8.12	16.14
CO2 MASS GRAMS	1719.1	2356.6	7346.5	1612.2
NOX MASS GRAMS	19.19	24.91	84.55	19.60
FUEL KG (LB)	.547 (1.21)	.742 (1.63)	2.301 (5.07)	.514 (1.13)
KW HR (HP HR)	1.74 (2.34)	2.80 (3.75)	9.25 (12.41)	1.69 (2.26)
BSHC G/KW HR (G/HP HR)	.99 (.74)	.93 (.70)	.53 (.40)	1.57 (1.17)
BSCO G/KW HR (G/HP HR)	10.61 (7.91)	2.68 (2.00)	.88 (.65)	9.56 (7.13)
BSCO2 G/KW HR (G/HP HR)	987.14 (736.11)	842.54 (628.28)	793.95 (592.05)	954.68 (711.91)
BSNOX G/KW HR (G/HP HR)	11.02 (8.22)	8.91 (6.64)	9.14 (6.81)	11.61 (8.66)
BSFC KG/KW HR (LB/HP HR)	.314 (.516)	.265 (.436)	.249 (.409)	.304 (.500)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.48 (20.76)	
BSHC G/KW HR (G/HP HR)	.77 (.57)	
BSCO G/KW HR (G/HP HR)	3.24 (2.42)	
BSCO2 G/KW HR (G/HP HR)	842. (628.)	
BSNOX G/KW HR (G/HP HR)	9.58 (7.14)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.265 (.436)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.913 (32.25)
MULTIPLIER FOR	G/TEST	1.281
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0828 (.0617)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3123 (.1416)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.29 (2765.0)

TABLE C-10A. TEST D18-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. D18
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.D18-1 RUN
DATE 5/27/80
TIME 9:00
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 46. PCT
ABSOLUTE HUMIDITY 9.3 GM/KG(65.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)
BLOWER INLET P MM. H2O(IN. H2O)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	6177.	6259.	6367.	6197.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	286.5 (10118.)	290.3 (10252.)	295.3 (10429.)	287.4 (10150.)
HC SAMPLE METER/RANGE/PPM	38.8/11/ 39.	42.0/11/ 42.	40.7/11/ 41.	33.0/11/ 33.
HC BCKGRD METER/RANGE/PPM	18.3/ 1/ 18.	18.9/ 1/ 19.	15.1/ 1/ 15.	12.4/ 1/ 12.
CO SAMPLE METER/RANGE/PPM	52.4/13/ 50.	51.7/13/ 49.	41.0/13/ 38.	27.4/13/ 25.
CO BCKGRD METER/RANGE/PPM	1.3/13/ 1.	1.3/13/ 1.	1.3/13/ 1.	1.5/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	20.9/ 3/ .34	29.9/ 3/ .49	60.5/ 3/ 1.07	19.6/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.3/ 3/ .05	3.6/ 3/ .06	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	25.4/ 2/ 25.	43.7/ 2/ 44.	45.2/ 3/ 136.	27.0/ 2/ 27.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.6/ 2/ 1.	.1/ 3/ 0.	.1/ 2/ 0.
DILUTION FACTOR	38.76	26.65	12.40	41.80
HC CONCENTRATION PPM	21.	24.	27.	21.
CO CONCENTRATION PPM	48.	47.	36.	23.
CO2 CONCENTRATION PCT	.29	.45	1.02	.27
NOX CONCENTRATION PPM	24.7	43.1	135.3	26.9
HC MASS GRAMS	3.47	3.99	4.57	3.47
CO MASS GRAMS	15.85	15.77	12.22	7.66
CO2 MASS GRAMS	1533.0	2366.7	5527.2	1405.4
NOX MASS GRAMS	13.54	23.94	76.43	14.79
FUEL KG (LB)	.490 (1.08)	.750 (1.65)	1.735 (3.83)	.446 (.98)
KW HR (HP HR)	1.34 (1.79)	2.49 (3.34)	7.69 (10.32)	1.39 (1.86)
BSHC G/KW HR (G/HP HR)	2.60 (1.94)	1.61 (1.20)	.59 (.44)	2.49 (1.86)
BSCO G/KW HR (G/HP HR)	11.85 (8.84)	6.34 (4.73)	1.59 (1.18)	5.51 (4.11)
BSCO2 G/KW HR (G/HP HR)	1146.90 (855.25)	951.45 (709.50)	718.52 (535.30)	1011.21 (754.06)
BSNOX G/KW HR (G/HP HR)	10.13 (7.56)	9.63 (7.18)	9.94 (7.41)	10.64 (7.94)
BSFC KG/KW HR (LB/HP HR)	.366 (.602)	.302 (.496)	.226 (.371)	.321 (.527)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.91 (17.31)	
BSHC G/KW HR (G/HP HR)	1.20 (.90)	
BSCO G/KW HR (G/HP HR)	3.99 (2.98)	
BSCO2 G/KW HR (G/HP HR)	839. (626.)	
BSNOX G/KW HR (G/HP HR)	9.97 (7.44)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.265 (.436)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.871 (30.77)
MULTIPLIER FOR	G/TEST	1.331
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1031 (.0769)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3891 (.1765)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	76.99 (2719.1)

TABLE C-10A. TEST D18-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 018
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.D18-1 RUN
DATE 5/27/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 52. PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)	820.4 (32.3)
BLOWER INLET P MM. H2O(IN. H2O)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)	701.0 (27.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	6176.	6259.	6366.	6196.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	286.3 (10113.)	290.2 (10249.)	295.1 (10424.)	287.2 (10145.)
HC SAMPLE METER/RANGE/PPM	23.1/11/ 23.	34.7/11/ 35.	33.9/11/ 34.	26.8/11/ 27.
HC BCKGRD METER/RANGE/PPM	9.3/ 1/ 9.	9.8/ 1/ 10.	9.7/ 1/ 10.	9.5/ 1/ 10.
CO SAMPLE METER/RANGE/PPM	31.2/13/ 28.	45.3/13/ 42.	39.2/13/ 36.	27.5/13/ 25.
CO BCKGRD METER/RANGE/PPM	2.3/13/ 2.	2.3/13/ 2.	2.3/13/ 2.	2.1/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	19.5/ 3/ .31	28.7/ 3/ .47	63.3/ 3/ 1.13	18.6/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.3/ 3/ .05	3.6/ 3/ .06	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	26.4/ 2/ 26.	46.0/ 2/ 46.	50.6/ 3/ 152.	27.4/ 2/ 27.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.4/ 2/ 0.	.1/ 3/ 0.	.5/ 2/ 1.
DILUTION FACTOR	42.11	27.91	11.80	44.22
HC CONCENTRATION PPM	14.	25.	25.	18.
CO CONCENTRATION PPM	26.	39.	33.	22.
CO2 CONCENTRATION PCT	.27	.42	1.08	.25
NOX CONCENTRATION PPM	25.8	45.6	151.5	26.9
HC MASS GRAMS	2.31	4.22	4.25	2.90
CO MASS GRAMS	8.58	13.27	11.32	7.51
CO2 MASS GRAMS	1391.2	2252.2	5827.9	1307.5
NOX MASS GRAMS	14.14	25.32	85.54	14.79
FUEL KG (LB)	.441 (.97)	.713 (1.57)	1.828 (4.03)	.415 (.91)
KW HR (HP HR)	1.36 (1.83)	2.47 (3.31)	7.69 (10.32)	1.47 (1.97)
BSHC G/KW HR (G/HP HR)	1.69 (1.26)	1.71 (1.27)	.55 (.41)	1.98 (1.47)
BSCO G/KW HR (G/HP HR)	6.29 (4.69)	5.37 (4.01)	1.47 (1.10)	5.11 (3.81)
BSCO2 G/KW HR (G/HP HR)	1020.52 (761.00)	911.91 (680.01)	757.61 (564.95)	889.77 (663.50)
BSNOX G/KW HR (G/HP HR)	10.37 (7.73)	10.25 (7.64)	11.12 (8.29)	10.06 (7.50)
BSFC KG/KW HR (LB/HP HR)	.323 (.531)	.289 (.475)	.238 (.391)	.282 (.464)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.99 (17.43)	
BSHC G/KW HR (G/HP HR)	1.05 (.79)	
BSCO G/KW HR (G/HP HR)	3.13 (2.33)	
BSCO2 G/KW HR (G/HP HR)	829. (619.)	
BSNOX G/KW HR (G/HP HR)	10.76 (8.02)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.261 (.430)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.887 (31.33)
MULTIPLIER FOR	G/TEST	1.307
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1005 (.0750)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3847 (.1745)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	76.57 (2704.6)

TABLE C-10B. TEST D18-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D18
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.D18-2 RUN
DATE 5/28/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 740.66 MM HG(29.16 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 10.4 GM/KG(73.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1	2	3	4
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	823.0 (32.4)	823.0 (32.4)	823.0 (32.4)	823.0 (32.4)
BLOWER INLET P MM. H2O(IN. H2O)	706.1 (27.8)	705.1 (27.8)	706.1 (27.8)	706.1 (27.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)	50.0 (122.0)
BLOWER REVOLUTIONS	6175.	6251.	6368.	6198.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	287.4 (10152.)	291.4 (10293.)	296.4 (10469.)	288.5 (10189.)
HC SAMPLE METER/RANGE/PPM	31.9/11/ 32.	36.1/11/ 36.	35.6/11/ 36.	29.1/11/ 29.
HC BCKGRD METER/RANGE/PPM	9.1/ 1/ 9.	9.7/ 1/ 10.	9.2/ 1/ 9.	9.1/ 1/ 9.
CO SAMPLE METER/RANGE/PPM	56.0/13/ 53.	54.9/13/ 52.	43.9/13/ 41.	27.7/13/ 25.
CO BCKGRD METER/RANGE/PPM	1.5/13/ 1.	1.6/13/ 1.	1.6/13/ 1.	2.2/13/ 2.
CO2 SAMPLE METER/RANGE/PCT	20.7/ 3/ .33	29.6/ 3/ .49	62.7/ 3/ 1.12	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.7/ 3/ .04	3.0/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	23.4/ 2/ 23.	41.3/ 2/ 41.	46.2/ 3/ 139.	26.4/ 2/ 26.
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1.	.5/ 2/ 1.	.1/ 3/ 0.	.4/ 2/ 0.
DILUTION FACTOR	39.19	26.95	11.92	45.19
HC CONCENTRATION PPM	23.	27.	27.	20.
CO CONCENTRATION PPM	51.	50.	38.	23.
CO2 CONCENTRATION PCT	.29	.45	1.07	.24
NOX CONCENTRATION PPM	22.6	40.8	138.3	26.0
HC MASS GRAMS	3.81	4.51	4.64	3.36
CO MASS GRAMS	17.04	16.82	13.11	7.57
CO2 MASS GRAMS	1520.1	2395.1	5833.8	1293.4
NOX MASS GRAMS	12.44	22.75	78.43	14.35
FUEL KG (LB)	.486 (1.07)	.760 (1.68)	1.831 (4.04)	.411 (.91)
KW HR (HP HR)	1.28 (1.72)	2.43 (3.26)	7.67 (10.29)	1.39 (1.86)
BSHC G/KW HR (G/HP HR)	2.97 (2.21)	1.85 (1.38)	.60 (.45)	2.42 (1.80)
BSCO G/KW HR (G/HP HR)	13.28 (9.90)	6.91 (5.15)	1.71 (1.27)	5.45 (4.06)
BSCO2 G/KW HR (G/HP HR)	1184.33 (883.15)	983.89 (733.69)	750.12 (566.82)	930.65 (693.98)
BSNOX G/KW HR (G/HP HR)	9.69 (7.23)	9.35 (6.97)	10.22 (7.62)	10.33 (7.70)
BSFC KG/KW HR (LB/HP HR)	.379 (.623)	.312 (.513)	.239 (.392)	.295 (.486)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.78 (17.14)	
BSHC G/KW HR (G/HP HR)	1.28 (.95)	
BSCO G/KW HR (G/HP HR)	4.27 (3.18)	
BSCO2 G/KW HR (G/HP HR)	864. (644.)	
BSNOX G/KW HR (G/HP HR)	10.01 (7.47)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.273 (.449)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.872 (30.80)
MULTIPLIER FOR	G/TEST	1.334
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1044 (.0778)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3825 (.1735)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.65 (2778.0)

TABLE C-10B (CONT'D). TEST D18-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D18
ENGINE MODEL 79 CUMMINS NTC-290
ENGINE 0.0 L(0. CID) I-6
CVS NO. 10

TEST NO.D18-2 RUN
DATE 5/28/80
TIME
DYNO NO. 5

DIESEL EM-408-F
BAG CART NO. 1

BAROMETER 739.90 MM HG(29.13 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 60. PCT
ABSOLUTE HUMIDITY 11.4 GM/KG(79.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	797.6 (31.4)	797.6 (31.4)	797.6 (31.4)	797.6 (31.4)
BLOWER INLET P MM. H2O(IN. H2O)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)	680.7 (26.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)	50.6 (123.0)
BLOWER REVOLUTIONS	6175.	6259.	6366.	6196.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	287.7 (10161.)	291.6 (10299.)	296.6 (10475.)	288.7 (10195.)
HC SAMPLE METER/RANGE/PPM	24.5/11/ 25.	37.5/11/ 38.	36.5/11/ 37.	29.1/11/ 29.
HC BCKGRD METER/RANGE/PPM	12.9/ 1/ 13.	11.7/ 1/ 12.	12.0/ 1/ 12.	11.8/ 1/ 12.
CO SAMPLE METER/RANGE/PPM	29.9/13/ 27.	42.7/13/ 40.	36.1/13/ 33.	30.4/13/ 28.
CO BCKGRD METER/RANGE/PPM	.9/13/ 1.	.7/13/ 1.	.9/13/ 1.	5.6/13/ 5.
CO2 SAMPLE METER/RANGE/PCT	18.8/ 3/ .30	27.9/ 3/ .46	60.8/ 3/ 1.08	19.3/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.9/ 3/ .04	2.7/ 3/ .04	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	26.4/ 2/ 26.	45.9/ 2/ 46.	50.9/ 3/ 153.	30.1/ 2/ 30.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.6/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	43.73	28.75	12.34	42.49
HC CONCENTRATION PPM	12.	26.	26.	18.
CO CONCENTRATION PPM	26.	38.	31.	22.
CO2 CONCENTRATION PCT	.26	.42	1.04	.26
NOX CONCENTRATION PPM	25.7	45.3	152.4	29.5
HC MASS GRAMS	1.98	4.41	4.36	2.93
CO MASS GRAMS	8.58	12.88	10.71	7.45
CO2 MASS GRAMS	1390.8	2219.3	5653.5	1400.6
NOX MASS GRAMS	14.15	25.28	86.47	16.30
FUEL KG (LB)	.440 (.97)	.703 (1.55)	1.774 (3.91)	.444 (.98)
KW HR (HP HR)	1.43 (1.91)	2.46 (3.30)	7.66 (10.27)	1.50 (2.01)
BSHC G/KW HR (G/HP HR)	1.39 (1.03)	1.79 (1.34)	.57 (.43)	1.96 (1.46)
BSCO G/KW HR (G/HP HR)	6.02 (4.49)	5.23 (3.90)	1.40 (1.04)	4.98 (3.71)
BSCO2 G/KW HR (G/HP HR)	975.89 (727.72)	901.82 (672.49)	738.34 (550.58)	936.19 (698.12)
BSNOX G/KW HR (G/HP HR)	9.93 (7.40)	10.27 (7.66)	11.29 (8.42)	10.89 (8.12)
BSFC KG/KW HR (LB/HP HR)	.309 (.508)	.286 (.470)	.232 (.381)	.296 (.487)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	13.04 (17.49)	
BSHC G/KW HR (G/HP HR)	1.05 (.78)	
BSCO G/KW HR (G/HP HR)	3.04 (2.27)	
BSCO2 G/KW HR (G/HP HR)	818. (610.)	
BSNOX G/KW HR (G/HP HR)	10.91 (8.13)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.258 (.424)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.874 (30.86)
MULTIPLIER FOR	G/TEST	1.333
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1022 (.0762)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3967 (.1799)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	78.18 (2761.2)

TABLE C-11A. TEST D19-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D19
ENGINE MODEL 79 IHC DTI 466
ENGINE 0.0 LC 0. CID) I-6
CVS NO. 10

TEST NO.19-3C RUN 1
DATE 6/ 8/80
TIME
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 58. PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)
BLOWER INLET P MM. H2O(IN. H2O)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3362.	3369.	3428.	3336.
TIME SECONDS	299.9	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	159.0 (5615.)	159.3 (5627.)	162.1 (5726.)	157.8 (5572.)
HC SAMPLE METER/RANGE/PPM	8.1/22/ 41.	7.2/22/ 36.	8.1/22/ 41.	5.9/22/ 29.
HC BCKGRD METER/RANGE/PPM	3.5/ 1/ 9.	8.7/ 1/ 9.	8.4/ 1/ 8.	8.0/ 1/ 8.
CO SAMPLE METER/RANGE/PPM	64.8/13/ 63.	39.2/13/ 36.	32.7/13/ 30.	25.0/13/ 22.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.2/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	29.4/ 3/ .48	39.3/ 3/ .66	82.2/ 3/ 1.52	20.1/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	3.1/ 3/ .05	3.0/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	43.3/ 2/ 43.	53.4/ 2/ 53.	41.6/ 3/ 125.	30.0/ 2/ 30.
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1.	1.1/ 2/ 1.	.4/ 3/ 1.	2.0/ 2/ 2.
DILUTION FACTOR	27.06	19.95	8.80	40.80
HC CONCENTRATION PPM	32.	28.	33.	22.
CO CONCENTRATION PPM	61.	35.	28.	22.
CO2 CONCENTRATION PCT	.44	.62	1.47	.28
NOX CONCENTRATION PPM	42.4	52.4	123.7	28.0
HC MASS GRAMS	2.97	2.53	3.10	1.96
CO MASS GRAMS	11.32	6.48	5.33	3.98
CO2 MASS GRAMS	1291.9	1808.1	4378.3	800.4
NOX MASS GRAMS	12.90	15.96	38.37	8.46
FUEL KG (LB)	.412 (.91)	.570 (1.26)	1.372 (3.02)	.254 (.56)
KW HR (HP HR)	.91 (1.22)	1.70 (2.28)	5.75 (7.70)	1.01 (1.35)
BSHC G/KW HR (G/HP HR)	3.26 (2.43)	1.49 (1.11)	.54 (.40)	1.94 (1.45)
BSCO G/KW HR (G/HP HR)	12.41 (9.25)	3.81 (2.84)	.93 (.69)	3.95 (2.94)
BSCO2 G/KW HR (G/HP HR)	1416.38 (1056.57)	1063.82 (793.29)	762.11 (568.30)	793.19 (591.48)
BSNOX G/KW HR (G/HP HR)	14.15 (10.55)	9.39 (7.00)	6.68 (4.98)	8.39 (6.26)
BSFC KG/KW HR (LB/HP HR)	.451 (.742)	.335 (.551)	.239 (.393)	.251 (.413)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.893 (31.54)
MULTIPLIER FOR	G/TEST	.715
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0763 (.0569)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2741 (.1243)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.37 (12.56)	
BSHC G/KW HR (G/HP HR)	1.13 (.84)	
BSCO G/KW HR (G/HP HR)	2.89 (2.16)	
BSCO2 G/KW HR (G/HP HR)	884. (659.)	
BSNOX G/KW HR (G/HP HR)	8.08 (6.03)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.278 (.458)	

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TABLE C-11A (CONT'D). TEST D19-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. D1?
ENGINE MODEL 79 IHC DTI 466
ENGINE 0.0 LC 0. CID) I-6
CVS NO. 10

TEST NO.19-3C RUN 1
DATE 3/ 8/80
TIME
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 38. PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)	259.1 (10.2)
BLOWER INLET P MM. H2O(IN. H2O)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)	213.4 (8.4)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	3325.	3369.	3427.	3336.
TIME SECONDS	296.0	299.9	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	157.3 (5554.)	159.3 (5628.)	162.1 (5725.)	157.8 (5573.)
HC SAMPLE METER/RANGE/PPM	20.3/11/ 20.	27.2/11/ 27.	38.2/11/ 38.	29.5/11/ 30.
HC BCKGRD METER/RANGE/PPM	8.0/ 1/ 8.	8.1/ 1/ 8.	6.8/ 1/ 7.	7.4/ 1/ 7.
CO SAMPLE METER/RANGE/PPM	30.3/13/ 27.	30.2/13/ 27.	32.0/13/ 29.	23.3/13/ 21.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.2/13/ 0.	.1/13/ 0.	.2/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	24.3/ 3/ .40	34.2/ 3/ .57	81.5/ 3/ 1.50	20.9/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	36.6/ 2/ 37.	46.8/ 2/ 47.	41.5/ 3/ 125.	29.9/ 2/ 30.
NOX BCKGRD METER/RANGE/PPM	1.6/ 2/ 2.	1.5/ 2/ 2.	.4/ 3/ 1.	1.4/ 2/ 1.
DILUTION FACTOR	33.49	23.24	8.89	39.19
HC CONCENTRATION PPM	13.	19.	32.	22.
CO CONCENTRATION PPM	27.	26.	28.	20.
CO2 CONCENTRATION PCT	.35	.53	1.46	.29
NOX CONCENTRATION PPM	35.0	45.4	123.4	28.5
HC MASS GRAMS	1.14	1.79	3.01	2.03
CO MASS GRAMS	4.88	4.89	5.21	3.70
CO2 MASS GRAMS	997.6	1547.2	4338.1	848.7
NOX MASS GRAMS	10.54	13.83	38.27	8.61
FUEL KG (LB)	.315 (.69)	.487 (1.07)	1.359 (3.00)	.269 (.59)
KW HR (HP HR)	.96 (1.28)	1.71 (2.29)	5.75 (7.72)	1.00 (1.34)
BSHC G/KW HR (G/HP HR)	1.19 (.89)	1.04 (.78)	.52 (.39)	2.03 (1.51)
BSCO G/KW HR (G/HP HR)	5.10 (3.80)	2.86 (2.13)	.91 (.68)	3.70 (2.76)
BSCO2 G/KW HR (G/HP HR)	1043.50 (778.14)	905.60 (675.31)	753.94 (562.21)	848.47 (632.70)
BSNOX G/KW HR (G/HP HR)	11.03 (8.22)	8.09 (6.04)	6.65 (4.96)	8.61 (6.42)
BSFC KG/KW HR (LB/HP HR)	.329 (.541)	.285 (.469)	.236 (.388)	.269 (.442)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.42 (12.63)	
BSHC G/KW HR (G/HP HR)	.85 (.63)	
BSCO G/KW HR (G/HP HR)	1.93 (1.48)	
BSCO2 G/KW HR (G/HP HR)	821. (612.)	
BSNOX G/KW HR (G/HP HR)	7.57 (5.64)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.258 (.424)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.950 (33.55)
MULTIPLIER FOR	G/TEST	.670
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0711 (.0530)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2758 (.1251)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE C-12A. TEST D22-1 EMISSIONS RESULTS

C-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-1 RUN1
DATE 1/26/81
TIME 9:28
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 61. PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)
BLOWER INLET P MM. H2O(IN. H2O)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6264.	6371.	6202.
TIME SECONDS	296.0	300.0	305.0	296.9
TOTAL FLOW STD. CU. METRES(SCF)	300.5 (10615.)	304.6 (10757.)	309.8 (10941.)	301.5 (10651.)
HC SAMPLE METER/RANGE/PPM	17.7/23/ 88.	10.8/23/ 54.	10.5/23/ 53.	6.3/23/ 32.
HC BCKGRD METER/RANGE/PPM	9.5/ 2/ 10.	9.2/ 2/ 9.	9.4/ 2/ 9.	9.0/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	57.2/13/ 55.	64.7/13/ 62.	55.4/12/ 120.	25.6/13/ 23.
CO BCKGRD METER/RANGE/PPM	.6/13/ 1.	.5/13/ 0.	.2/12/ 0.	.3/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	22.6/ 3/ .37	28.4/ 3/ .47	57.1/ 3/ 1.01	18.1/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.7/ 3/ .04	2.6/ 3/ .04	2.3/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	38.0/ 2/ 38.	38.9/ 2/ 39.	72.8/ 2/ 73.	26.3/ 2/ 26.
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0.	.3/ 2/ 0.	.5/ 2/ 1.	.4/ 2/ 0.
DILUTION FACTOR	35.24	27.99	13.11	45.43
HC CONCENTRATION PPM	79.	45.	44.	23.
CO CONCENTRATION PPM	53.	60.	115.	23.
CO2 CONCENTRATION PCT	.32	.43	.97	.26
NOX CONCENTRATION PPM	37.7	38.6	72.3	25.9
HC MASS GRAMS	13.71	7.89	7.85	3.95
CO MASS GRAMS	18.40	21.36	41.31	7.93
CO2 MASS GRAMS	1777.5	2384.1	5496.2	1409.2
NOX MASS GRAMS	21.68	22.49	42.86	14.95
FUEL KG (LB)	.577 (1.27)	.762 (1.68)	1.743 (3.84)	.448 (.99)
KW HR (HP HR)	1.32 (1.77)	2.12 (2.84)	6.33 (8.49)	1.37 (1.84)
BSHC G/KW HR (G/HP HR)	10.37 (7.73)	3.72 (2.77)	1.24 (.92)	2.88 (2.15)
BSCO G/KW HR (G/HP HR)	13.92 (10.38)	10.08 (7.51)	6.52 (4.86)	5.78 (4.31)
BSCO2 G/KW HR (G/HP HR)	1344.74 (1002.78)	1124.65 (838.65)	867.63 (646.99)	1027.37 (766.11)
BSNOX G/KW HR (G/HP HR)	16.40 (12.23)	10.61 (7.91)	6.77 (5.05)	10.90 (8.12)
BSFC KG/KW HR (LB/HP HR)	.437 (.718)	.360 (.591)	.275 (.452)	.326 (.536)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.15 (14.95)	
BSHC G/KW HR (G/HP HR)	3.00 (2.23)	
BSCO G/KW HR (G/HP HR)	7.98 (5.95)	
BSCO2 G/KW HR (G/HP HR)	993. (740.)	
BSNOX G/KW HR (G/HP HR)	9.15 (6.82)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.317 (.521)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.954 (33.69)
MULTIPLIER FOR	G/TEST	1.275
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1144 (.0853)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3613 (.1639)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.41 (2875.6)

TABLE C-12A (CONT'D). TEST D22-1 EMISSIONS RESULTS

H-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-1 RUN1
DATE 1/26/81
TIME 10:18
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 11.2 GM/KG(78.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)	698.5 (27.5)
BLOWER INLET P MM. H2O(IN. H2O)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)	520.7 (20.5)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6264.	6370.	6202.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	300.4 (10611.)	304.5 (10754.)	309.6 (10936.)	301.5 (10647.)
HC SAMPLE METER/RANGE/PPM	7.6/23/ 38.	10.3/23/ 51.	9.2/23/ 46.	5.9/23/ 29.
HC BCKGRD METER/RANGE/PPM	8.5/ 2/ 9.	8.6/ 2/ 9.	8.7/ 2/ 9.	8.7/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	29.8/13/ 27.	57.3/13/ 55.	98.1/13/ 100.	24.5/13/ 22.
CO BCKGRD METER/RANGE/PPM	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.	.1/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	18.3/ 3/ .29	24.7/ 3/ .40	53.5/ 3/ .93	16.8/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.1/ 3/ .03	2.1/ 3/ .03	1.9/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	28.4/ 2/ 28.	34.9/ 2/ 35.	77.8/ 2/ 78.	28.6/ 2/ 29.
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1.	.7/ 2/ 1.	1.0/ 2/ 1.	.9/ 2/ 1.
DILUTION FACTOR	44.76	32.46	14.12	49.11
HC CONCENTRATION PPM	30.	43.	38.	21.
CO CONCENTRATION PPM	27.	53.	96.	22.
CO2 CONCENTRATION PCT	.26	.37	.91	.24
NOX CONCENTRATION PPM	27.9	34.2	76.9	27.7
HC MASS GRAMS	5.18	7.56	6.78	3.62
CO MASS GRAMS	9.33	18.85	34.71	7.65
CO2 MASS GRAMS	1414.3	2070.4	5132.7	1321.4
NOX MASS GRAMS	16.04	19.93	45.53	15.98
FUEL KG (LB)	.451 (.99)	.663 (1.46)	1.625 (3.58)	.420 (.93)
KW HR (HP HR)	1.36 (1.82)	2.17 (2.91)	6.33 (8.49)	1.36 (1.82)
BSHC G/KW HR (G/HP HR)	3.81 (2.84)	3.48 (2.60)	1.07 (.80)	2.66 (1.99)
BSCO G/KW HR (G/HP HR)	6.86 (5.12)	8.69 (6.48)	5.48 (4.09)	5.63 (4.20)
BSCO2 G/KW HR (G/HP HR)	1040.54 (775.93)	954.21 (711.56)	810.25 (604.20)	972.21 (724.98)
BSNOX G/KW HR (G/HP HR)	11.80 (8.80)	9.19 (6.85)	7.19 (5.36)	11.76 (8.77)
BSFC KG/KW HR (LB/HP HR)	.332 (.546)	.305 (.502)	.257 (.422)	.309 (.508)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.22 (15.05)	
BSHC G/KW HR (G/HP HR)	2.06 (1.54)	
BSCO G/KW HR (G/HP HR)	6.29 (4.69)	
BSCO2 G/KW HR (G/HP HR)	886. (660.)	
BSNOX G/KW HR (G/HP HR)	8.69 (6.48)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.281 (.463)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.910 (32.16)
MULTIPLIER FOR	G/TEST	1.336
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1190 (.0887)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4228 (.1918)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	81.07 (2863.4)

TABLE C-12B. TEST D22-2 EMISSIONS RESULTS

C-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-2 RUN1
DATE 1/27/81
TIME 9:45
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 57. PCT
ABSOLUTE HUMIDITY 10.2 GM/KG(71.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)	716.3 (28.2)
BLOWER INLET P MM. H2O(IN. H2O)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6179.	6264.	6369.	6202.
TIME SECONDS	295.9	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.4 (10577.)	303.6 (10722.)	308.7 (10902.)	300.6 (10616.)
HC SAMPLE METER/RANGE/PPM	17.9/23/ 90.	10.4/23/ 52.	10.1/23/ 50.	6.0/23/ 30.
HC BCKGRD METER/RANGE/PPM	8.3/ 2/ 8.	9.5/ 2/ 10.	10.0/ 2/ 10.	9.3/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	46.7/13/ 44.	69.7/13/ 68.	61.8/12/ 136.	27.3/13/ 25.
CO BCKGRD METER/RANGE/PPM	1.6/13/ 1.	1.4/13/ 1.	.1/12/ 0.	.5/13/ 0.
CO2 SAMPLE METER/RANGE/PCT	19.5/ 3/ .31	28.0/ 3/ .46	57.4/ 3/ 1.01	18.8/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.3/ 3/ .04	3.1/ 3/ .05	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	33.5/ 2/ 34.	41.9/ 2/ 42.	78.8/ 2/ 79.	30.2/ 2/ 30.
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0.	.4/ 2/ 0.	.7/ 2/ 1.	.9/ 2/ 1.
DILUTION FACTOR	41.06	28.39	13.01	43.68
HC CONCENTRATION PPM	81.	43.	41.	21.
CO CONCENTRATION PPM	41.	65.	131.	24.
CO2 CONCENTRATION PCT	.27	.43	.97	.26
NOX CONCENTRATION PPM	33.2	41.5	78.2	29.3
HC MASS GRAMS	14.07	7.47	7.31	3.64
CO MASS GRAMS	14.44	22.90	47.10	8.39
CO2 MASS GRAMS	1496.5	2370.0	5469.8	1420.0
NOX MASS GRAMS	19.02	24.11	46.15	16.86
FUEL KG (LB)	.488 (1.08)	.758 (1.67)	1.737 (3.83)	.451 (.99)
KW HR (HP HR)	1.37 (1.84)	2.21 (2.96)	6.47 (8.68)	1.41 (1.89)
BSHC G/KW HR (G/HP HR)	10.26 (7.65)	3.39 (2.52)	1.13 (.84)	2.58 (1.92)
BSCO G/KW HR (G/HP HR)	10.52 (7.85)	10.37 (7.74)	7.28 (5.43)	5.96 (4.44)
BSCO2 G/KW HR (G/HP HR)	1090.97 (813.54)	1073.76 (800.70)	845.17 (630.24)	1007.73 (751.46)
BSNOX G/KW HR (G/HP HR)	13.87 (10.34)	10.92 (8.14)	7.13 (5.32)	11.96 (8.92)
BSFC KG/KW HR (LB/HP HR)	.356 (.585)	.343 (.565)	.268 (.441)	.320 (.526)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.46 (15.37)	
BSHC G/KW HR (G/HP HR)	2.83 (2.11)	
BSCO G/KW HR (G/HP HR)	8.10 (6.04)	
BSCO2 G/KW HR (G/HP HR)	939. (700.)	
BSNOX G/KW HR (G/HP HR)	9.26 (6.91)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.300 (.493)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.890 (31.42)	
MULTIPLIER FOR	G/TEST	1.363	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1189 (.0887)	
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3969 (.1800)	

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.79 (2853.7)

TABLE C-12B (CONT'D). TEST D22-2 EMISSIONS RESULTS

H-TRANS.

ENGINE NO.D22
ENGINE MODEL 79 CUMMINS NH-250
ENGINE 0.0 L(0. CID)
CVS NO. 10

TEST NO.D22-2 RUN1
DATE 1/27/81
TIME 10:25
DYNO NO. 5

DIESEL EM-465-F
BAG CART NO. 1

BAROMETER 738.63 MM HG(29.08 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 55. PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0000

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)	718.8 (28.3)
BLOWER INLET P MM. H2O(IN. H2O)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)	541.0 (21.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181.	6264.	6369.	6201.
TIME SECONDS	296.0	300.0	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	299.3 (10570.)	303.3 (10712.)	308.4 (10891.)	300.2 (10604.)
HC SAMPLE METER/RANGE/PPM	10.1/23/ 50.	10.8/23/ 54.	9.3/23/ 47.	6.3/23/ 32.
HC BCKGRD METER/RANGE/PPM	8.7/ 2/ 9.	9.0/ 2/ 9.	8.9/ 2/ 9.	8.5/ 2/ 9.
CO SAMPLE METER/RANGE/PPM	34.2/13/ 32.	61.2/13/ 59.	52.8/12/ 113.	26.9/13/ 25.
CO BCKGRD METER/RANGE/PPM	.5/13/ 0.	.2/13/ 0.	.3/12/ 1.	.8/13/ 1.
CO2 SAMPLE METER/RANGE/PCT	18.4/ 3/ .29	25.9/ 3/ .42	55.6/ 3/ .98	18.4/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.2/ 3/ .03	2.6/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	32.1/ 2/ 32.	40.4/ 2/ 40.	86.5/ 2/ 87.	32.2/ 2/ 32.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.5/ 2/ 1.	.8/ 2/ 1.	.5/ 2/ 1.
DILUTION FACTOR	44.27	30.85	13.51	44.65
HC CONCENTRATION PPM	42.	45.	38.	23.
CO CONCENTRATION PPM	30.	57.	108.	23.
CO2 CONCENTRATION PCT	.26	.39	.94	.25
NOX CONCENTRATION PPM	31.5	39.9	85.8	31.7
HC MASS GRAMS	7.22	7.92	6.81	4.02
CO MASS GRAMS	10.60	20.15	38.88	8.17
CO2 MASS GRAMS	1426.3	2170.5	5304.1	1397.8
NOX MASS GRAMS	18.04	23.16	50.59	18.21
FUEL KG (LB)	.457 (1.01)	.695 (1.53)	1.681 (3.71)	.444 (.98)
KW HR (HP HR)	1.38 (1.86)	2.21 (2.96)	6.45 (8.65)	1.37 (1.84)
BSHC G/KW HR (G/HP HR)	5.22 (3.89)	3.59 (2.68)	1.06 (.79)	2.93 (2.18)
BSCO G/KW HR (G/HP HR)	7.66 (5.71)	9.13 (6.81)	6.03 (4.50)	5.96 (4.44)
BSCO2 G/KW HR (G/HP HR)	1030.44 (768.40)	983.38 (733.30)	822.73 (613.51)	1019.01 (759.88)
BSNOX G/KW HR (G/HP HR)	13.03 (9.72)	10.49 (7.82)	7.85 (5.85)	13.28 (9.90)
BSFC KG/KW HR (LB/HP HR)	.330 (.543)	.315 (.518)	.261 (.429)	.324 (.532)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	11.41 (15.30)	
BSHC G/KW HR (G/HP HR)	2.28 (1.70)	
BSCO G/KW HR (G/HP HR)	6.82 (5.08)	
BSCO2 G/KW HR (G/HP HR)	903. (673.)	
BSNOX G/KW HR (G/HP HR)	9.64 (7.19)	(from bag readings)
BSFC KG/KW HR (LB/HP HR)	.287 (.472)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.915 (32.33)
MULTIPLIER FOR	G/TEST	1.323
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1160 (.0865)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.4037 (.1831)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	79.71 (2815.4)

APPENDIX D

THIRTEEN-MODE TEST RESULTS

Table Number	Engine Number	Description
D-1	D-1	1978 Cat. 3208 DINA
D-2	D-3	1976 Cummins NTC-350
D-3	D-3	1978 DDA 6V92T
D-4	D-4	1979 Cummins NTCC-350
D-5	D-5	1978 DDA 8V-71N
D-6	D-6	1979 DDA 6V92TA
D-7	D-7	1979 IH DTI-466B
D-8	D-9	1979 Mack ETAZ
D-9	D-10	1980 Mack ETSX
D-10	D-11	1979 Cummins VTB-903
D-11	D-12	1979 Cat. 3406 DITA
D-12	D-13	1979 Cat. 3406 PCTA
D-13	D-14	1979 Cummins B. C. NTC-350
D-14	D-15	1979 IH DT-466
D-15	D-16	1979 DDA 6V-92TA (90mm)
D-16	D-17	1979 DDA 8V-71TA
D-17	D-18	1979 Cummins NTC-290
D-		1979 Cummins NH-250

TABLE D-1A. ENGINE D1 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT # 11-5044-001 DATE 2-28-79 TEST NO.1
ENGINE # CAT 3208 FUEL # EM-273-F LFE NO. J41251 BAROMETER = 29.09

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 650	0	0.0	.01	3.32	7.3	.976	460	322	1.25	20	29	40	4	1
2	2	INTER / 1680	11	1.9	.06	8.44	7.3	.974	612	374	1.52	18	146	179	14	2
3	25	INTER / 1680	156	27.4	.13	8.40	7.3	.971	480	425	3.34	140	116	204	107	3
4	50	INTER / 1680	312	54.9	.21	8.31	7.3	.967	376	244	5.38	410	92	116	310	4
5	75	INTER / 1680	468	82.3	.31	8.23	7.6	.966	340	178	7.59	700	88	88	546	5
6	100	INTER / 1680	624	109.8	.41	8.06	7.6	.961	192	604	11.10	1025	46	270	724	6
7		IDLE / 650	0	0.0	.01	3.32	6.8	.956	468	322	1.16	28	33	46	6	7
8	100	RATED / 2800	515	151.1	.59	12.37	6.2	.946	82	970	10.29	780	31	673	841	8
9	75	RATED / 2800	387	113.3	.46	12.37	6.2	.945	456	400	8.07	540	165	275	577	9
10	50	RATED / 2800	258	75.6	.34	12.41	5.6	.935	520	464	5.93	335	184	318	352	10
11	25	RATED / 2800	129	37.8	.23	12.41	5.3	.926	556	578	3.97	140	198	404	149	11
12	2	RATED / 2800	11	3.2	.13	11.96	5.3	.922	984	630	2.09	25	346	441	27	12
13		IDLE / 650	0	0.0	.02	3.29	5.1	.912	488	322	1.34	40	46	61	11	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	35.09	49.34	4.91	R	R	R	.0041	.0695	.059	.987	.0063	52.2	.991	R	.067	1
2	38.37	47.02	3.62	76.56	93.82	7.23	.0076	.0695	.109	.985	.0076	.9	1.017	1.962	.080	2
3	14.42	25.21	13.25	4.24	7.42	3.90	.0161	.0695	.232	.970	.0161	-.4	1.017	.289	.080	3
4	7.24	9.13	24.35	1.68	2.12	5.65	.0257	.0695	.370	.954	.0253	-1.8	1.016	.228	.080	4
5	4.75	4.74	29.60	1.06	1.06	6.64	.0377	.0695	.542	.937	.0352	-6.7	1.016	.221	.080	5
6	1.89	11.00	29.46	.42	2.46	6.60	.0512	.0695	.737	.910	.0507	-1.0	1.015	.221	.080	6
7	38.23	52.89	7.22	R	R	R	.0044	.0695	.063	.988	.0059	34.5	.991	R	.067	7
8	.86	19.00	23.75	.20	4.45	5.57	.0481	.0695	.692	.916	.0473	-1.6	1.051	.223	.080	8
9	5.99	9.98	20.93	1.46	2.43	5.09	.0374	.0695	.538	.933	.0375	.1	1.051	.231	.080	9
10	9.08	15.66	17.37	2.44	4.20	4.66	.0274	.0695	.395	.949	.0279	1.9	1.050	.256	.080	10
11	14.11	28.80	10.61	5.23	10.68	3.93	.0190	.0695	.273	.965	.0191	.7	1.049	.354	.080	11
12	44.56	56.92	3.42	*8.60	*8.74	8.34	.0109	.0695	.157	.980	.0106	-2.5	1.048	2.326	.080	12
13	34.80	46.11	8.58	R	R	R	.0067	.0695	.097	.987	.0067	-.1	.991	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	2.285	GRAM/KW-HR	(1.705	GRAM/BHP-HR)
BSCO ------- =	4.701	GRAM/KW-HR	(3.507	GRAM/BHP-HR)
BSNOX ------ =	5.576	GRAM/KW-HR	(4.159	GRAM/BHP-HR)
BSHC + BSNOX =	7.861	GRAM/KW-HR	(5.864	GRAM/BHP-HR)
CORR. BSFC - =	.257	KG/KW-HR	(.423	LBS/BHP-HR)

TABLE D-1B. ENGINE D1 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT : 11-5044-001 DATE 2-28-79 TEST NO.2
ENGINE : CAT 3208 FUEL : EM-273-F LFE NO. J41251 BAROMETER=29.07

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 650	0	0.0	.02	3.33	4.6	.894	488	271	1.43	50	39	43	12	1
2	2	INTER / 1680	11	1.9	.06	8.46	4.6	.895	592	322	1.52	35	135	148	24	2
3	25	INTER / 1680	156	27.4	.13	8.42	4.6	.903	468	374	3.40	160	109	171	109	3
4	50	INTER / 1680	312	54.9	.21	8.33	4.6	.911	368	218	5.61	405	85	98	271	4
5	75	INTER / 1680	464	81.6	.30	8.25	4.6	.921	344	165	7.88	660	84	76	463	5
6	100	INTER / 1680	621	109.3	.41	8.12	4.6	.934	160	630	11.57	987	38	274	659	6
7		IDLE / 650	0	0.0	.01	3.29	4.6	.893	456	297	1.21	40	28	36	7	7
8	100	RATED / 2800	495	145.2	.58	12.37	4.6	.931	96	993	10.63	730	34	625	740	8
9	75	RATED / 2800	370	108.6	.46	12.37	4.6	.922	448	412	8.17	540	159	278	552	9
10	50	RATED / 2800	247	72.4	.34	12.37	4.6	.913	528	451	6.01	320	185	305	324	10
11	25	RATED / 2800	123	36.2	.24	12.37	4.6	.906	552	527	4.17	150	190	356	151	11
12	2	RATED / 2800	9	2.8	.13	11.95	4.6	.899	1000	591	2.19	30	341	402	30	12
13		IDLE / 650	0	0.0	.02	3.28	4.6	.895	536	271	1.43	35	47	48	9	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	32.85	36.62	9.93	R	R	R	.0059	.0695	.085	.986	.0071	20.0	.991	R	.067	1
2	37.26	40.66	6.50	70.81	77.28	12.36	.0072	.0695	.103	.986	.0076	6.0	1.017	1.869	.080	2
3	13.84	21.85	13.86	3.96	6.25	3.96	.0156	.0695	.225	.970	.0163	4.6	1.016	.281	.080	3
4	6.82	7.83	21.76	1.55	1.78	4.94	.0251	.0695	.361	.952	.0263	4.9	1.016	.224	.080	4
5	4.64	4.23	25.63	1.03	.94	5.67	.0366	.0695	.527	.935	.0364	-.5	1.016	.218	.080	5
6	1.51	11.01	26.48	.34	2.51	6.03	.0513	.0695	.739	.908	.0527	2.7	1.014	.225	.080	6
7	35.91	47.03	9.29	R	R	R	.0039	.0695	.057	.988	.0061	54.7	.991	R	.067	7
8	.98	17.89	21.17	.24	4.31	5.10	.0473	.0695	.681	.914	.0488	3.0	1.051	.229	.080	8
9	5.82	10.16	20.15	1.47	2.56	5.08	.0371	.0695	.534	.933	.0379	2.2	1.051	.240	.080	9
10	9.10	15.03	15.99	2.55	4.21	4.48	.0275	.0695	.395	.949	.0283	3.1	1.051	.266	.080	10
11	13.38	25.07	10.62	5.25	9.83	4.16	.0192	.0695	.277	.964	.0200	3.9	1.051	.373	.080	11
12	43.41	51.18	3.84	*2.34	*4.23	10.81	.0110	.0695	.158	.980	.0111	.7	1.049	2.687	.080	12
13	35.96	36.51	6.93	R	R	R	.0067	.0695	.096	.986	.0071	6.5	.991	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	2.271	GRAM/KW-HR	(1.694 GRAM/BHP-HR)
BSCO ------- =	4.435	GRAM/KW-HR	(3.308 GRAM/BHP-HR)
BSNOX ------ =	5.227	GRAM/KW-HR	(3.899 GRAM/BHP-HR)
BSHC + BSNOX =	7.498	GRAM/KW-HR	(5.594 GRAM/BHP-HR)
CORR. BSFC - =	.263	KG/KW-HR	(.432 LBS/BHP-HR)

TABLE D-2A. ENGINE D2 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT: 11-5044-001 DATE: 4-4-79 TEST D2-4
ENGINE: CUMMINS NTC350 FUEL: EM-273-F LFE NO. J41251 BAROMETER 29.24

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 648	0	0.0	.02	4.18	6.5	.945	160	126	1.25	0	18	28	0	1
2	2	INTER / 1500	28	4.5	.10	9.52	6.5	.945	100	152	2.24	38	28	84	32	2
3	25	INTER / 1500	353	55.4	.25	11.57	6.5	.947	60	190	4.93	350	19	119	341	3
4	50	INTER / 1500	705	110.8	.45	13.63	6.3	.944	49	318	7.13	937	19	245	1121	4
5	75	INTER / 1500	1058	166.2	.69	15.98	6.3	.946	40	687	8.67	1700	19	612	2354	5
6	100	INTER / 1500	1411	221.6	.85	18.84	6.9	.954	56	1320	9.73	2425	32	1393	4012	6
7		IDLE / 648	0	0.0	.02	4.12	7.1	.959	156	139	1.61	6	14	25	2	7
8	100	RATED / 2100	1194	262.5	1.01	29.16	6.1	.944	110	248	7.50	1425	94	396	3616	8
9	75	RATED / 2100	895	196.9	.80	25.64	5.5	.935	72	152	6.52	975	56	228	2249	9
10	50	RATED / 2100	597	131.2	.58	21.87	5.5	.934	48	152	5.46	587	32	197	1170	10
11	25	RATED / 2100	298	65.6	.39	18.11	5.5	.932	56	152	4.37	262	31	166	937	11
12	2	RATED / 2100	24	5.4	.18	14.81	5.5	.930	88	164	2.88	62	34	125	72	12
13		IDLE / 648	0	0.0	.02	4.10	5.0	.916	160	152	1.25	-0	18	35	0	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	12.67	20.06	0.00	R	R	I	.0056	.0695	.081	.988	.0060	7.0	.982	R	.067	1
2	4.51	13.46	5.30	6.17	18.69	7.26	.0108	.0695	.155	.979	.0107	-1.2	.987	1.386	.080	2
3	1.26	7.81	22.37	.35	2.15	6.15	.0221	.0695	.318	.957	.0230	4.3	.991	.278	.080	3
4	.71	9.03	41.26	.17	2.22	10.12	.0339	.0695	.481	.940	.0330	-1.2	.993	.247	.080	4
5	.49	16.00	61.49	.11	3.68	14.16	.0402	.0695	.578	.928	.0400	-.4	.997	.231	.080	5
6	.62	27.23	78.43	.14	6.29	18.11	.0455	.0695	.655	.920	.0450	-1.2	1.001	.231	.080	6
7	9.67	17.26	1.17	R	R	R	.0059	.0695	.085	.984	.0077	30.9	.983	R	.067	7
8	1.56	6.54	59.73	.36	1.51	13.78	.0348	.0695	.501	.937	.0347	-.5	1.018	.227	.080	8
9	1.16	4.73	46.61	.29	1.16	11.42	.0316	.0695	.454	.945	.0302	-4.3	1.011	.242	.080	9
10	.92	5.65	33.45	.24	1.50	8.91	.0268	.0695	.386	.953	.0254	-5.2	1.004	.265	.080	10
11	1.33	7.05	18.61	.42	2.52	6.66	.0218	.0695	.313	.962	.0205	-6.0	.998	.359	.080	11
12	3.11	11.49	6.64	6.28	23.20	13.40	.0123	.0695	.177	.974	.0136	11.0	.994	2.032	.080	12
13	12.64	24.15	0.00	R	R	I	.0059	.0695	.085	.988	.0061	2.0	.981	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.333	GRAM/KW-HR	(.248 GRAM/BHP-HR)
BSCO ------- =	2.983	GRAM/KW-HR	(2.225 GRAM/BHP-HR)
BSNOX ------ =	12.627	GRAM/KW-HR	(9.420 GRAM/BHP-HR)
BSHC + BSNOX =	12.960	GRAM/KW-HR	(9.668 GRAM/BHP-HR)
CORR. BSFC - =	.261	KG/KW-HR	(.429 LBS/BHP-HR)

TABLE D-2B. ENGINE D2 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT: 11-5044-001 DATE: 4-6-79 TEST D2-6
ENGINE: CUMMINS NTC350 FUEL: EM-273-F LFE NO. J41251 BAROMETER 29.27

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 648	0	0.0	.02	4.21	8.6	.984	132	127	1.38	-0	13	26	0	1
2	2	INTER / 1500	28	4.5	.11	10.13	8.6	.983	96	152	2.19	25	28	88	23	2
3	25	INTER / 1500	353	55.4	.27	11.59	8.6	.980	52	165	5.01	313	17	107	326	3
4	50	INTER / 1500	705	110.8	.43	13.77	8.6	.977	46	293	7.13	775	18	217	922	4
5	75	INTER / 1500	1058	166.2	.62	16.36	8.6	.976	42	687	8.67	1625	19	599	2270	5
6	100	INTER / 1500	1411	221.6	.85	19.20	9.3	.983	58	1406	9.84	2363	32	1455	3946	6
7		IDLE / 648	0	0.0	.02	4.15	9.3	1.001	128	114	1.34	6	14	25	2	7
8	100	RATED / 2100	1194	262.5	1.05	29.06	8.2	.971	104	229	7.59	1425	92	386	3827	8
9	75	RATED / 2100	895	196.9	.80	25.71	8.2	.972	66	127	6.43	963	52	192	2330	9
10	50	RATED / 2100	597	131.2	.58	21.91	8.2	.973	46	127	5.69	550	29	157	1089	10
11	25	RATED / 2100	298	65.6	.37	18.01	7.9	.968	50	139	4.44	250	26	142	405	11
12	2	RATED / 2100	24	5.4	.17	14.53	7.7	.959	90	165	2.61	50	35	128	61	12
13		IDLE / 648	0	0.0	.02	4.15	7.7	.959	138	127	1.38	6	14	27	2	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	9.53	18.39	0.00	R	R	I	.0056	.0695	.081	.986	.0066	18.3	.982	R	.067	1
2	4.43	13.97	3.71	6.24	19.68	5.23	.0105	.0695	.150	.979	.0104	-.3	.987	1.427	.080	2
3	1.08	6.68	20.38	.31	1.93	5.89	.0232	.0695	.334	.956	.0234	.7	.989	.292	.080	3
4	.68	8.33	35.36	.16	1.96	8.32	.0318	.0695	.458	.940	.0330	3.7	.992	.237	.080	4
5	.52	16.00	60.66	.12	3.60	13.66	.0384	.0695	.553	.928	.0400	4.1	.997	.226	.080	5
6	.63	28.66	77.76	.14	6.56	17.81	.0444	.0695	.640	.919	.0455	2.4	1.002	.228	.080	6
7	9.51	17.01	1.47	R	R	R	.0059	.0695	.085	.986	.0064	9.7	.985	R	.067	7
8	1.46	6.12	60.71	.35	1.47	14.58	.0365	.0695	.525	.936	.0351	-3.8	1.018	.236	.080	8
9	1.08	4.01	48.56	.26	.98	11.83	.0314	.0695	.452	.945	.0298	-5.0	1.011	.241	.080	9
10	.85	4.53	31.38	.22	1.20	8.29	.0266	.0695	.383	.951	.0265	-.6	1.006	.263	.080	10
11	1.17	6.35	18.15	.40	2.16	6.17	.0208	.0695	.300	.961	.0208	-.2	1.001	.340	.080	11
12	3.50	12.75	6.09	6.53	23.79	11.36	.0116	.0695	.167	.976	.0124	6.7	.996	1.874	.080	12
13	9.95	18.38	1.37	R	R	R	.0059	.0695	.085	.986	.0066	13.0	.984	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.315	GRAM/KW-HR	(.235	GRAM/BHP-HR)
BSCO ------- =	2.897	GRAM/KW-HR	(2.161	GRAM/BHP-HR)
BSNOX ------ =	12.461	GRAM/KW-HR	(9.296	GRAM/BHP-HR)
BSHC + BSNOX =	12.775	GRAM/KW-HR	(9.531	GRAM/BHP-HR)
CORR. BSFC - =	.260	KG/KW-HR	(.427	LBS/BHP-HR)

TABLE D-3A. ENGINE D3 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT: 11-5044-001 DATE: 5-14-79 TEST D3-1
ENGINE: DDA 6V-92T FUEL: EM-321-F LFE NO. J41251 BAROMETER 29.30

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 535	0	0.0	.02	5.11	8.4	.989	202	139	.91	125	28	39	58	1
2	2	INTER / 1260	29	3.2	.07	13.17	8.4	.989	152	139	1.16	75	55	100	88	2
3	25	INTER / 1260	302	39.9	.19	14.24	8.4	.985	108	88	2.94	250	43	69	319	3
4	50	INTER / 1260	606	80.0	.32	15.43	8.4	.982	100	114	4.72	475	42	94	634	4
5	75	INTER / 1260	909	119.9	.47	17.41	8.0	.974	100	358	6.10	825	48	333	1230	5
6	100	INTER / 1260	1226	161.8	.64	20.28	8.6	.983	76	1463	6.86	1150	44	1625	2063	6
7		IDLE / 535	0	0.0	.02	5.14	8.6	1.000	152	127	.83	125	19	33	53	7
8	100	RATED / 2100	1017	223.7	.89	32.18	9.0	.990	116	178	5.77	1025	113	335	3138	8
9	75	RATED / 2100	762	167.6	.69	29.66	9.0	.993	100	114	4.79	710	89	199	2021	9
10	50	RATED / 2100	509	111.9	.51	27.24	9.0	.996	106	101	3.84	435	87	163	1146	10
11	25	RATED / 2100	254	55.8	.33	24.77	9.0	1.000	112	101	2.71	240	84	150	585	11
12	2	RATED / 2100	20	4.5	.18	22.82	9.0	1.003	136	114	1.56	110	92	154	245	12
13		IDLE / 535	0	0.0	.02	5.10	9.0	1.006	184	139	.79	145	27	41	70	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	21.61	29.97	43.79	R	R	R	.0043	.0695	.062	.990	.0045	3.3	.981	R	.067	1
2	12.94	23.80	20.85	16.94	31.15	27.30	.0054	.0695	.077	.988	.0056	4.4	.991	1.321	.080	2
3	3.75	6.05	27.83	1.08	1.74	8.00	.0135	.0695	.195	.973	.0139	2.5	.993	.290	.080	3
4	2.20	4.89	32.90	.53	1.18	7.93	.0210	.0695	.302	.959	.0221	5.1	.995	.242	.080	4
5	1.72	11.86	43.74	.40	2.78	10.26	.0271	.0695	.391	.948	.0284	4.8	.999	.235	.080	5
6	1.15	42.46	53.89	.27	10.05	12.75	.0317	.0695	.457	.941	.0324	2.0	1.007	.235	.080	6
7	17.89	30.13	48.74	R	R	R	.0036	.0695	.051	.991	.0041	14.1	.982	R	.067	7
8	2.10	6.25	58.55	.50	1.50	14.03	.0280	.0695	.403	.950	.0269	-4.0	1.042	.230	.080	8
9	2.17	4.82	49.03	.53	1.19	12.06	.0234	.0695	.336	.958	.0224	-4.1	1.033	.238	.080	9
10	2.84	5.33	37.54	.78	1.45	10.24	.0188	.0695	.271	.966	.0180	-4.2	1.025	.266	.080	10
11	4.21	7.53	29.38	1.50	2.69	10.49	.0135	.0695	.194	.975	.0128	-5.1	1.017	.351	.080	11
12	8.71	14.64	23.29	20.49	34.43	54.76	.0078	.0695	.112	.985	.0075	-3.5	1.012	2.323	.080	12
13	22.58	34.41	54.32	R	R	R	.0039	.0695	.056	.991	.0039	.2	.982	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.784	GRAM/KW-HR	(.585 GRAM/BHP-HR)
BSCO ------- =	3.426	GRAM/KW-HR	(2.556 GRAM/BHP-HR)
BSNOX ------ =	12.001	GRAM/KW-HR	(8.953 GRAM/BHP-HR)
BSHC + BSNOX =	12.785	GRAM/KW-HR	(9.538 GRAM/BHP-HR)
CORR. BSFC - =	.264	KG/KW-HR	(.433 LBS/BHP-HR)

TABLE D-3B. ENGINE D3 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT: 11-5044-001 DATE: 5-15-79 TEST D3-2
ENGINE: DDA 6V-92T FUEL: EM-321-F LFE NO. J41251 BAROMETER 29.34

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 635	0	0.0	.02	4.98	7.5	.963	192	127	.99	138	23	31	53	1
2	2	INTER / 1260	24	3.2	.07	12.94	7.5	.963	140	152	1.21	88	51	111	102	2
3	25	INTER / 1260	307	40.4	.19	14.17	7.5	.962	100	88	3.05	250	39	68	306	3
4	50	INTER / 1260	613	80.9	.34	15.51	7.5	.962	96	114	4.79	488	42	97	659	4
5	75	INTER / 1260	920	121.3	.47	17.22	7.5	.962	96	423	6.18	850	46	392	1244	5
6	100	INTER / 1260	1227	162.0	.64	20.26	7.9	.966	82	1506	6.95	1150	47	1649	1999	6
7		IDLE / 635	0	0.0	.02	4.94	7.9	.968	138	114	.83	150	15	25	52	7
8	100	RATED / 2100	1082	238.0	.96	32.84	7.9	.967	112	216	6.26	1063	108	401	3133	8
9	75	RATED / 2100	811	178.4	.73	30.30	8.1	.974	106	101	5.15	700	94	174	1925	9
10	50	RATED / 2100	541	119.0	.53	27.54	8.1	.975	104	101	4.17	425	81	155	1045	10
11	25	RATED / 2100	270	59.4	.33	24.80	8.8	.990	112	101	2.94	200	78	139	449	11
12	2	RATED / 2100	20	4.5	.19	22.80	8.8	.993	134	113	1.70	75	88	149	162	12
13		IDLE / 635	0	0.0	.02	5.00	8.8	.995	184	152	.91	125	21	36	48	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	18.99	25.30	93.48	R	R	R	.0041	.0695	.059	.989	.0048	17.2	.982	R	.067	1
2	11.44	24.97	22.86	15.78	34.45	31.54	.0058	.0695	.083	.988	.0059	1.5	.992	1.390	.080	2
3	3.35	5.84	26.22	.97	1.68	7.56	.0138	.0695	.199	.972	.0144	4.2	.993	.290	.080	3
4	2.08	4.82	32.64	.52	1.20	8.14	.0218	.0695	.314	.958	.0224	2.5	.995	.251	.080	4
5	1.63	13.82	93.87	.38	3.23	10.25	.0276	.0695	.398	.947	.0288	4.3	1.000	.234	.080	5
6	1.23	93.13	52.29	.29	10.18	12.34	.0317	.0695	.456	.941	.0328	3.5	1.009	.234	.080	6
7	16.29	27.14	56.78	R	R	R	.0031	.0695	.044	.991	.0040	31.3	.982	R	.067	7
8	1.88	6.99	54.61	.45	1.68	13.16	.0293	.0695	.422	.947	.0291	-.8	1.043	.231	.080	8
9	2.15	3.98	44.08	.53	.97	10.79	.0242	.0695	.348	.956	.0240	-.7	1.036	.236	.080	9
10	2.58	4.91	33.06	.68	1.30	8.78	.0193	.0695	.277	.963	.0195	1.4	1.027	.259	.080	10
11	3.89	6.94	22.37	1.32	2.35	7.57	.0136	.0695	.196	.973	.0139	2.1	1.019	.332	.080	11
12	7.90	13.34	14.44	19.77	33.39	36.15	.0082	.0695	.119	.984	.0081	-1.4	1.012	2.475	.080	12
13	19.70	32.79	44.07	R	R	R	.0037	.0695	.053	.990	.0045	22.1	.981	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.719 GRAM/KW-HR	(.536 GRAM/BHP-HR)
BSCO ------- =	3.388 GRAM/KW-HR	(2.527 GRAM/BHP-HR)
BSNOX ------ =	11.072 GRAM/KW-HR	(8.260 GRAM/BHP-HR)
BSHC + BSNOX =	11.791 GRAM/KW-HR	(8.796 GRAM/BHP-HR)
CORR. BSFC - =	.262 KG/KW-HR	(.431 LBS/BHP-HR)

TABLE D-4A. ENGINE D4 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT: 11-5044-001 DATE: 6-27-79 TEST D4-1
ENGINE: NTCC-350 FUEL: EM-321-F LFE NO. J41251 BAROMETER 29.35

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 700	0	0.0	.04	4.53	11.4	1.039	260	129	1.70	90	33	33	40	1
2	2	INTER / 1140	24	2.9	.06	7.52	10.6	1.020	206	129	1.94	105	40	50	70	2
3	25	INTER / 1140	335	40.0	.17	7.75	10.6	1.011	108	129	5.15	355	23	53	255	3
4	50	INTER / 1140	670	80.0	.32	8.43	10.6	1.003	82	528	8.47	675	20	243	551	4
5	75	INTER / 1140	1005	120.0	.50	10.13	11.1	1.002	40	2443	11.10	750	12	1320	735	5
6	100	INTER / 1140	1340	160.0	.69	11.97	11.1	.998	58	3213	12.94	795	20	2046	927	6
7		IDLE / 700	0	0.0	.04	4.46	11.6	1.036	200	129	1.94	120	24	31	50	7
8	100	RATED / 1900	1299	258.5	1.01	23.78	12.1	1.021	112	313	8.98	1010	82	429	2510	8
9	75	RATED / 1900	974	193.8	.73	21.01	11.1	1.011	88	129	7.78	720	53	148	1467	9
10	50	RATED / 1900	650	129.3	.53	18.08	11.1	1.015	80	103	6.60	485	41	102	845	10
11	25	RATED / 1900	324	64.5	.33	15.34	11.6	1.027	90	103	4.72	270	40	88	409	11
12	2	RATED / 1900	231	45.9	.14	13.77	12.2	1.044	200	155	2.29	110	75	116	144	12
13		IDLE / 700	0	0.0	.04	4.52	12.7	1.055	190	103	2.09	120	21	22	46	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	15.21	15.10	18.29	R	R	R	.0081	.0695	.117	.983	.0082	1.1	.992	R	.067	1
2	10.65	13.31	18.50	13.75	17.18	23.89	.0084	.0695	.121	.980	.0093	10.1	.996	1.296	.080	2
3	2.19	5.08	24.32	.57	1.33	6.37	.0228	.0695	.328	.954	.0240	5.5	.996	.263	.080	3
4	1.04	12.60	28.57	.25	3.04	6.88	.0385	.0695	.555	.929	.0391	1.4	.999	.241	.080	4
5	.39	43.83	24.39	.10	11.00	6.12	.0501	.0695	.721	.908	.0515	2.8	1.005	.250	.080	5
6	.49	49.30	22.34	.13	12.79	5.79	.0585	.0695	.841	.895	.0597	2.2	1.012	.256	.080	6
7	10.34	13.31	21.49	R	R	R	.0087	.0695	.126	.981	.0093	6.4	1.003	R	.067	7
8	1.34	7.06	41.31	.32	1.66	9.71	.0431	.0695	.620	.925	.0413	-4.2	1.056	.223	.080	8
9	1.21	3.37	33.42	.27	.76	7.57	.0352	.0695	.507	.934	.0358	1.8	1.043	.217	.080	9
10	1.28	3.17	26.37	.32	.79	6.54	.0299	.0695	.430	.943	.0306	2.2	1.032	.240	.080	10
11	1.98	4.42	20.43	.61	1.37	6.34	.0220	.0695	.316	.958	.0221	.4	1.022	.303	.080	11
12	8.80	13.57	16.89	1.63	2.52	3.14	.0104	.0695	.150	.978	.0109	4.8	1.015	.183	.080	12
13	9.16	9.89	20.41	R	R	R	.0085	.0695	.122	.979	.0100	18.0	.996	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.430	GRAM/KW-HR	(.320	GRAM/BHP-HR)
BSCO ------- =	4.262	GRAM/KW-HR	(3.180	GRAM/BHP-HR)
BSNOX ------ =	7.331	GRAM/KW-HR	(5.469	GRAM/BHP-HR)
BSHC + BSNOX =	7.760	GRAM/KW-HR	(5.789	GRAM/BHP-HR)
CORR. BSFC - =	.245	KG/KW-HR	(.403	LBS/BHP-HR)

TABLE D-4B. ENGINE D4 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

PROJECT: 11-5044-001 DATE: 7-6-79 TEST D4-3
ENGINE: NTCC-350 FUEL: EM321-F LFE NO. J41251 BAROMETER 29.27

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 700	0	0.0	.04	4.50	12.6	1.098	220	181	1.84	113	25	42	48	1
2	2	INTER / 1140	26	3.1	.06	7.48	12.6	1.097	196	181	1.84	115	41	76	88	2
3	25	INTER / 1140	335	40.0	.18	7.23	12.6	1.068	104	181	5.08	370	22	76	285	3
4	50	INTER / 1140	671	80.2	.31	8.46	12.6	1.040	85	500	8.17	690	21	231	584	4
5	75	INTER / 1140	1006	120.1	.48	9.90	12.6	1.018	46	2256	10.75	850	13	1201	831	5
6	100	INTER / 1140	1343	160.3	.68	11.62	12.4	1.000	24	3378	12.81	875	8	2135	1014	6
7		IDLE / 700	0	0.0	.04	4.49	12.1	1.074	232	181	1.70	115	29	45	51	7
8	100	RATED / 1900	1299	258.5	.98	24.08	12.6	1.032	120	339	8.88	1050	86	457	2591	8
9	75	RATED / 1900	974	193.8	.75	20.81	12.6	1.042	78	155	7.69	710	48	183	1535	9
10	50	RATED / 1900	650	129.3	.53	18.25	12.6	1.055	70	129	6.43	488	37	130	905	10
11	25	RATED / 1900	324	64.5	.33	15.48	12.6	1.071	92	129	4.72	275	40	109	428	11
12	2	RATED / 1900	26	5.1	.19	13.56	12.6	1.093	200	181	2.34	125	73	131	167	12
13		IDLE / 700	0	0.0	.03	4.49	12.6	1.099	224	155	1.84	110	25	35	46	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR LB/HP-HR	MODAL WEIGHT FACTOR	MODE
1	11.93	19.60	22.50	R	R	R	.0080	.0695	.115	.981	.0089	10.9	.990	R	.067	1
2	10.64	19.62	22.89	13.33	24.59	28.69	.0087	.0695	.125	.981	.0088	1.7	.991	1.265	.080	2
3	2.13	7.21	27.09	.56	1.90	7.13	.0230	.0695	.330	.955	.0237	3.4	.990	.266	.080	3
4	1.11	12.37	31.34	.26	2.88	7.29	.0372	.0695	.535	.931	.0378	1.5	.992	.235	.080	4
5	.46	41.83	28.95	.11	9.99	6.92	.0489	.0695	.704	.911	.0499	1.9	.998	.239	.080	5
6	.20	52.30	24.84	.05	13.32	6.33	.0593	.0695	.853	.896	.0592	-.0	1.007	.253	.080	6
7	13.56	21.16	24.15	R	R	R	.0080	.0695	.115	.982	.0082	2.4	.993	R	.067	7
8	1.45	7.73	43.88	.33	1.77	10.02	.0414	.0695	.595	.925	.0408	-1.3	1.048	.218	.080	8
9	1.08	4.09	34.32	.25	.94	7.92	.0363	.0695	.522	.935	.0355	-2.3	1.033	.223	.080	9
10	1.15	4.07	28.26	.28	1.01	7.00	.0296	.0695	.426	.944	.0298	.6	1.020	.243	.080	10
11	2.03	5.54	21.68	.62	1.69	6.63	.0215	.0695	.310	.958	.0221	2.6	1.010	.303	.080	11
12	8.61	15.49	19.67	14.24	25.62	32.52	.0106	.0695	.152	.977	.0112	6.0	1.003	1.649	.080	12
13	12.16	16.80	21.94	R	R	R	.0078	.0695	.113	.981	.0089	12.8	.984	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.433	GRAM/KW-HR	(.323 GRAM/BHP-HR)
BSCO ------- =	4.579	GRAM/KW-HR	(3.416 GRAM/BHP-HR)
BSNOX ------ =	8.105	GRAM/KW-HR	(6.046 GRAM/BHP-HR)
BSHC + BSNOX =	8.537	GRAM/KW-HR	(6.369 GRAM/BHP-HR)
CORR. BSFC - =	.252	KG/KW-HR	(.415 LBS/BHP-HR)

TABLE D-5A. ENGINE D5 THIRTEEN-MODE EMISSIONS RESULTS
NO. 1 FUEL

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DDAD 8V-71N COACH S/N 8VA-377265 NO.1D FUEL BAROMETER 29.01
TEST D5-1 FUEL: EM-400-F PROJECT: 11-5044-001 DATE: 09/04/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 400	0	0.0	.019	5.12	13.9	1.117	158	107	.81	150	21	29	74	1
2	2	INTER / 1260	20	2.7	.081	16.43	13.9	1.115	128	173	1.07	100	79	153	161	2
3	25	INTER / 1260	250	32.9	.166	16.59	13.9	1.105	150	106	2.30	232	66	92	361	3
4	50	INTER / 1260	498	65.7	.272	16.39	13.9	1.092	153	80	3.65	360	71	72	576	4
5	75	INTER / 1260	746	98.4	.386	16.19	13.9	1.079	158	122	5.34	560	72	154	857	5
6	100	INTER / 1260	1004	132.4	.561	15.94	13.9	1.058	100	5050	7.52	890	45	4273	1300	6
7		IDLE / 400	0	0.0	.019	5.08	13.9	1.117	160	108	.69	128	26	35	75	7
8	100	RATED / 2100	844	185.5	.779	26.60	13.9	1.062	150	1030	7.02	820	105	1361	1886	8
9	75	RATED / 2100	632	139.0	.626	25.61	14.5	1.088	162	146	5.49	425	116	200	1035	9
10	50	RATED / 2100	422	92.8	.471	25.73	14.2	1.090	126	64	3.89	265	95	93	688	10
11	25	RATED / 2100	210	46.2	.308	25.93	14.2	1.101	158	53	2.60	168	114	75	429	11
12	2	RATED / 2100	16	3.6	.176	25.85	13.6	1.098	170	80	1.52	100	118	110	247	12
13		IDLE / 400	0	0.0	.017	5.04	13.6	1.104	180	56	.67	119	27	17	65	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	19.10	25.81	65.96	R	R	R	.0037	.0687	.054	.989	.0040	8.1	1.001	R	.067	1
2	16.32	31.59	33.21	29.45	56.99	59.92	.0050	.0687	.073	.987	.0053	5.8	1.024	1.763	.080	2
3	6.61	9.20	36.29	2.00	2.78	10.97	.0101	.0687	.148	.976	.0110	8.8	1.024	.295	.080	3
4	4.32	4.39	35.25	1.08	1.09	8.77	.0168	.0687	.245	.964	.0173	2.7	1.023	.243	.080	4
5	3.10	6.65	37.02	.73	1.56	8.71	.0242	.0687	.352	.949	.0251	4.0	1.024	.230	.080	5
6	1.34	46.83	38.60	.34	32.26	9.82	.0357	.0687	.520	.929	.0373	4.4	1.023	.249	.080	6
7	22.53	30.40	65.67	R	R	R	.0038	.0687	.055	.991	.0034	-9.9	1.000	R	.067	7
8	2.25	29.12	40.35	.57	7.33	10.16	.0310	.0687	.451	.935	.0331	7.0	1.062	.237	.080	8
9	3.09	5.34	27.57	.84	1.44	7.45	.0248	.0687	.361	.948	.0258	4.2	1.064	.254	.080	9
10	3.35	3.30	24.33	1.02	1.01	7.42	.0186	.0687	.270	.962	.0184	-.9	1.064	.286	.080	10
11	6.19	4.08	23.24	2.47	1.63	9.28	.0120	.0687	.175	.973	.0124	3.2	1.066	.375	.080	11
12	11.20	10.45	23.41	33.00	30.79	68.99	.0069	.0687	.100	.983	.0074	6.6	1.064	2.769	.080	12
13	26.19	16.29	62.37	R	R	R	.0035	.0687	.051	.991	.0033	-4.9	.999	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	1.180	GRAM/KW-HR	(.880 GRAM/BHP-HR)
BSCO ------- =	8.321	GRAM/KW-HR	(6.207 GRAM/BHP-HR)
BSNOX ------ =	9.658	GRAM/KW-HR	(7.205 GRAM/BHP-HR)
BSHC + BSNOX =	10.838	GRAM/KW-HR	(8.085 GRAM/BHP-HR)
CORR. BSFC - =	.278	KG/KW-HR	(.457 LBS/BHP-HR)

TABLE D-5B. ENGINE D5 THIRTEEN-MODE EMISSIONS RESULTS
NO. 1 FUEL

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DDAD 8V-71N COACH S/N 8VA-377265 NO.1D FUEL BAROMETER 29.03
TEST D5-2 FUEL: EM-400-F PROJECT: 11-5044-001 DATE: 09/04/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 400	0	0.0	.019	5.06	13.3	1.105	126	106	.73	130	20	33	73	1
2	2	INTER / 1260	20	2.7	.079	16.50	13.3	1.103	176	187	1.03	92	79	167	148	2
3	25	INTER / 1260	250	32.9	.171	16.50	13.3	1.093	135	119	2.23	215	63	109	353	3
4	50	INTER / 1260	498	65.7	.263	16.46	13.3	1.083	134	106	3.70	355	59	91	536	4
5	75	INTER / 1260	746	98.4	.382	16.25	13.3	1.070	142	226	5.49	535	62	189	781	5
6	100	INTER / 1260	1004	132.4	.561	16.00	13.3	1.050	92	5236	7.61	870	41	4367	1243	6
7		IDLE / 400	0	0.0	.019	4.97	13.3	1.105	130	146	.77	145	19	42	74	7
8	100	RATED / 2100	844	185.5	.792	25.72	13.3	1.057	132	990	6.91	805	95	1352	1847	8
9	75	RATED / 2100	632	139.0	.635	25.56	13.9	1.077	149	179	5.49	422	108	249	1032	9
10	50	RATED / 2100	422	92.8	.447	25.68	13.9	1.090	134	106	4.06	275	92	141	649	10
11	25	RATED / 2100	212	46.5	.306	25.96	13.9	1.101	138	106	2.57	162	100	152	416	11
12	2	RATED / 2100	16	3.6	.178	26.04	13.9	1.110	148	146	1.49	92	106	207	236	12
13		IDLE / 400	0	0.0	.020	4.96	13.9	1.116	162	146	.73	130	26	46	75	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	16.89	28.40	62.80	R	R	R	.0039	.0687	.056	.990	.0036	-6.9	.997	R	.067	1
2	16.72	35.39	31.34	29.37	62.17	55.06	.0048	.0687	.070	.987	.0051	5.3	1.021	1.720	.080	2
3	6.13	10.65	34.31	1.91	3.32	10.71	.0105	.0687	.153	.977	.0107	1.6	1.022	.306	.080	3
4	3.73	5.74	34.00	.90	1.38	8.16	.0162	.0687	.236	.964	.0175	8.5	1.023	.235	.080	4
5	2.71	8.25	34.10	.63	1.92	7.93	.0238	.0687	.347	.948	.0258	8.5	1.022	.228	.080	5
6	1.22	99.77	36.95	.31	32.97	9.39	.0355	.0687	.517	.928	.0378	6.4	1.021	.249	.080	6
7	16.47	36.94	66.15	R	R	R	.0038	.0687	.056	.990	.0038	-.3	1.000	R	.067	7
8	2.01	29.45	39.91	.51	7.29	10.22	.0312	.0687	.454	.936	.0326	4.5	1.061	.241	.080	8
9	2.84	6.54	27.09	.78	1.79	7.42	.0252	.0687	.367	.948	.0258	2.5	1.062	.258	.080	9
10	3.42	9.24	24.18	.99	1.52	7.00	.0177	.0687	.257	.960	.0192	8.8	1.061	.273	.080	10
11	5.46	8.24	22.64	2.16	3.26	8.94	.0120	.0687	.174	.974	.0123	2.8	1.063	.372	.080	11
12	9.91	19.39	22.14	29.63	57.78	65.98	.0069	.0687	.101	.983	.0072	4.5	1.063	2.803	.080	12
13	21.50	38.72	62.78	R	R	R	.0041	.0687	.059	.990	.0036	-10.9	.998	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	1.074	GRAM/KW-HR	(.801	GRAM/BHP-HR)
BSCO ------- =	8.910	GRAM/KW-HR	(6.647	GRAM/BHP-HR)
BSNOX ------ =	9.351	GRAM/KW-HR	(6.976	GRAM/BHP-HR)
BSHC + BSNOX =	10.425	GRAM/KW-HR	(7.777	GRAM/BHP-HR)
CORR. BSFC - =	.277	KG/KW-HR	(.456	LBS/BHP-HR)

TABLE D-5C. ENGINE D5 THIRTEEN-MODE EMISSIONS RESULTS
NO. 2 FUEL

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DDAD 8V-71N COACH S/N 8VA-377265 NO.2D FUEL BAROMETER 29.03
TEST D5-3 FUEL: EM-321-F PROJECT: 11-5044-001 DATE: 09/05/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 600	0	0.0	.015	5.02	13.4	1.091	152	106	.71	130	19	26	57	1
2	2	INTER / 1260	19	2.5	.074	16.65	13.4	1.089	174	186	1.12	100	68	146	140	2
3	25	INTER / 1260	250	32.9	.160	16.49	13.4	1.081	138	112	2.25	235	60	96	356	3
4	50	INTER / 1260	499	65.9	.262	14.34	13.4	1.070	134	77	3.73	383	58	66	570	4
5	75	INTER / 1260	746	98.4	.395	16.23	13.4	1.061	137	186	5.57	592	61	160	884	5
6	100	INTER / 1260	1024	135.1	.582	15.94	13.4	1.045	65	6680	7.99	869	28	5483	1217	6
7		IDLE / 600	0	0.0	.014	4.94	13.4	1.091	124	102	.75	150	13	22	57	7
8	100	RATED / 2100	891	196.0	.844	25.48	13.4	1.050	94	1883	7.39	835	67	2559	1944	8
9	75	RATED / 2100	667	146.8	.645	25.52	13.4	1.060	130	212	5.65	465	93	294	1115	9
10	50	RATED / 2100	445	97.8	.474	25.71	13.4	1.069	124	113	3.99	300	91	163	756	10
11	25	RATED / 2100	222	48.9	.310	25.91	13.4	1.078	136	113	2.63	188	98	161	472	11
12	2	RATED / 2100	18	3.9	.178	25.91	13.1	1.073	134	159	1.45	100	98	234	258	12
13		IDLE / 600	0	0.0	.014	4.94	13.1	1.078	156	159	.69	132	18	38	55	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	20.86	29.32	64.01	R	R	R	.0030	.0695	.043	.990	.0035	15.8	.998	R	.067	1
2	15.26	32.75	31.28	27.17	58.33	55.71	.0045	.0695	.065	.987	.0055	20.7	1.023	1.740	.080	2
3	6.21	10.02	37.11	1.81	2.92	10.81	.0098	.0695	.141	.977	.0107	8.8	1.023	.285	.080	3
4	3.70	4.18	36.28	.88	1.00	8.66	.0185	.0695	.266	.966	.0175	-5.3	1.023	.233	.080	4
5	2.57	6.76	37.26	.62	1.63	8.98	.0247	.0695	.355	.951	.0260	5.2	1.023	.236	.080	5
6	.81	44.96	34.83	.21	40.58	9.01	.0370	.0695	.533	.928	.0399	7.8	1.024	.253	.080	6
7	16.22	26.87	70.36	R	R	R	.0028	.0695	.040	.989	.0037	31.1	1.001	R	.067	7
8	1.32	50.52	38.38	.34	13.04	9.92	.0336	.0695	.483	.936	.0349	4.1	1.061	.244	.080	8
9	2.41	7.59	28.81	.63	2.00	7.59	.0256	.0695	.368	.950	.0264	2.9	1.062	.248	.080	9
10	3.21	5.73	26.55	.93	1.67	7.72	.0187	.0695	.269	.963	.0187	.2	1.062	.274	.080	10
11	5.26	8.44	25.36	2.00	3.30	9.65	.0121	.0695	.175	.974	.0125	2.7	1.064	.358	.080	11
12	9.20	21.88	24.10	25.40	60.39	66.51	.0070	.0695	.100	.984	.0070	.1	1.063	2.596	.080	12
13	21.83	44.84	65.49	R	R	R	.0029	.0695	.042	.990	.0034	18.5	.997	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.924	GRAM/KW-HR	(.689 GRAM/BHP-HR)
BSCO ------- =	11.392	GRAM/KW-HR	(8.499 GRAM/BHP-HR)
BSNOX ------ =	9.483	GRAM/KW-HR	(7.074 GRAM/BHP-HR)
BSHC + BSNOX =	10.406	GRAM/KW-HR	(7.763 GRAM/BHP-HR)
CORR. BSFC - =	.274	KG/KW-HR	(.451 LBS/BHP-HR)

TABLE D-5D. ENGINE D5 THIRTEEN-MODE EMISSIONS RESULTS
NO. 2 FUEL

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DDAD 8V-71N COACH S/N 8VA-372265 NO.2D FUEL BAROMETER 29.14
TEST D5-4 FUEL: EM-321-F PROJECT: 11-5044-001 DATE: 09/06/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 400	0	0.0	.012	5.03	13.8	1.117	132	106	.73	138	12	20	48	1
2	2	INTER / 1260	19	2.5	.073	16.64	13.8	1.113	121	173	1.04	98	71	144	148	2
3	25	INTER / 1260	251	33.1	.161	16.52	13.8	1.103	131	93	2.20	228	58	82	364	3
4	50	INTER / 1260	500	66.0	.263	16.48	13.8	1.092	132	53	3.63	360	59	47	564	4
5	75	INTER / 1260	746	98.4	.386	16.31	13.8	1.077	130	139	5.37	553	59	122	850	5
6	100	INTER / 1260	1029	135.1	.582	15.94	13.8	1.054	70	6468	7.80	840	31	5482	1225	6
7		IDLE / 400	0	0.0	.015	5.03	13.8	1.116	116	80	.81	161	13	18	64	7
8	100	RATED / 2100	891	196.0	.844	25.63	13.8	1.061	92	1597	7.29	820	67	2207	1962	8
9	75	RATED / 2100	651	143.2	.644	25.75	13.8	1.075	142	173	5.65	440	102	240	1069	9
10	50	RATED / 2100	445	97.8	.467	26.03	13.8	1.088	120	85	3.99	285	87	121	719	10
11	25	RATED / 2100	222	48.9	.308	26.22	13.8	1.099	128	82	2.63	170	92	116	433	11
12	2	RATED / 2100	18	3.9	.174	26.22	13.8	1.109	142	119	1.49	98	99	166	248	12
13		IDLE / 400	0	0.0	.016	4.99	13.8	1.116	152	119	.73	140	19	30	64	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	17.71	28.62	62.95	R	R	R	.0024	.0695	.034	.989	.0036	51.3	.991	R	.067	1
2	16.12	32.78	33.73	28.27	57.49	59.16	.0045	.0695	.064	.987	.0051	13.9	1.016	1.726	.080	2
3	6.03	8.52	37.59	1.76	2.49	10.99	.0099	.0695	.142	.978	.0105	5.6	1.016	.288	.080	3
4	3.75	2.96	35.78	.89	.71	8.54	.0162	.0695	.233	.966	.0171	5.5	1.016	.235	.080	4
5	2.53	5.24	36.67	.60	1.23	8.63	.0240	.0695	.345	.952	.0251	4.4	1.015	.232	.080	5
6	.89	45.76	34.80	.23	40.57	9.07	.0373	.0695	.537	.930	.0389	4.4	1.016	.256	.080	6
7	14.14	19.63	71.95	R	R	R	.0030	.0695	.043	.989	.0039	31.0	.993	R	.067	7
8	1.32	43.59	38.75	.34	11.26	10.01	.0334	.0695	.480	.936	.0344	3.0	1.055	.245	.080	8
9	2.63	6.20	27.66	.71	1.67	7.47	.0254	.0695	.365	.950	.0263	3.9	1.056	.256	.080	9
10	3.11	9.31	25.68	.89	1.24	7.35	.0182	.0695	.262	.963	.0187	3.0	1.057	.271	.080	10
11	4.96	6.30	23.42	1.87	2.38	8.84	.0119	.0695	.171	.974	.0124	4.6	1.058	.357	.080	11
12	9.52	15.98	23.81	25.57	42.91	63.95	.0067	.0695	.092	.984	.0072	6.6	1.059	2.535	.080	12
13	20.28	31.99	68.53	R	R	R	.0032	.0695	.046	.990	.0036	12.8	.994	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.923	GRAM/KW-HR	(.688 GRAM/BHP-HR)
BSCO ------- =	10.647	GRAM/KW-HR	(7.942 GRAM/BHP-HR)
BSNOX ------ =	9.369	GRAM/KW-HR	(6.989 GRAM/BHP-HR)
BSHC + BSNOX =	10.292	GRAM/KW-HR	(7.678 GRAM/BHP-HR)
CORR. BSFC - =	.276	KG/KW-HR	(.454 LBS/BHP-HR)

TABLE D-6A. ENGINE D6 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DDAD 6V92TA NOZZLE: 9875 NO.1-D FUEL BAROMETER 29.30
TEST D6-1 FUEL: EM-400-F PROJECT:11-5044-001 DATE: 09/25/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 500	0	0.0	.021	4.30	10.7	.982	188	66	.99	180	24	17	79	1
2	2	INTER / 1200	19	2.4	.066	12.01	10.7	.982	209	80	1.22	100	66	51	102	2
3	25	INTER / 1200	245	30.9	.194	12.66	10.2	.977	176	73	2.60	245	60	49	260	3
4	50	INTER / 1200	492	61.9	.294	13.35	9.7	.973	170	80	4.12	455	63	57	515	4
5	75	INTER / 1200	738	92.7	.360	14.98	9.7	.976	162	172	5.38	730	68	139	935	5
6	100	INTER / 1200	985	123.7	.470	16.88	9.7	.978	132	841	6.41	985	61	735	1379	6
7		IDLE / 500	0	0.0	.021	4.34	9.7	.966	194	83	.97	175	25	22	72	7
8	100	RATED / 2100	852	187.3	.733	30.96	9.7	.976	156	106	5.04	640	192	186	1784	8
9	75	RATED / 2100	639	140.5	.576	28.98	9.7	.979	150	106	4.33	475	124	170	1208	9
10	50	RATED / 2100	439	96.6	.442	26.72	9.7	.972	160	119	3.54	333	123	179	792	10
11	25	RATED / 2100	213	46.8	.300	24.39	10.2	.977	172	119	2.57	192	122	167	427	11
12	2	RATED / 2100	18	3.9	.168	22.60	10.2	.975	198	127	1.54	100	129	164	205	12
13		IDLE / 500	0	0.0	.021	4.34	9.7	.966	188	119	1.01	195	23	29	74	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	18.73	13.15	57.28	R	R	R	.0051	.0686	.074	.988	.0048	-4.0	1.003	R	.067	1
2	16.57	12.86	25.89	27.99	21.33	42.95	.0056	.0686	.081	.986	.0060	7.2	1.012	1.639	.080	2
3	6.89	5.61	30.00	1.93	1.57	8.42	.0115	.0686	.168	.974	.0124	7.9	1.012	.277	.080	3
4	4.27	3.87	35.15	1.01	.92	8.32	.0185	.0686	.269	.960	.0195	5.5	1.011	.234	.080	4
5	3.15	6.43	43.31	.73	1.50	10.09	.0243	.0686	.354	.950	.0253	4.3	1.013	.230	.080	5
6	2.16	26.06	48.72	.49	5.99	11.11	.0282	.0686	.411	.941	.0303	7.6	1.017	.229	.080	6
7	19.67	16.77	55.76	R	R	R	.0050	.0686	.073	.989	.0048	-4.4	1.002	R	.067	7
8	3.23	4.22	40.57	.76	.99	9.52	.0239	.0686	.349	.953	.0237	-.8	1.031	.228	.080	8
9	3.59	4.91	34.95	.88	1.21	8.60	.0201	.0686	.293	.959	.0205	1.9	1.043	.236	.080	9
10	4.64	6.75	29.86	1.27	1.85	8.19	.0167	.0686	.244	.966	.0168	.6	1.038	.264	.080	10
11	6.79	9.26	23.76	2.61	3.56	9.12	.0124	.0686	.181	.974	.0123	-.8	1.034	.371	.080	11
12	12.80	16.28	20.40	33.23	42.26	52.95	.0075	.0686	.109	.983	.0075	-.2	1.029	2.522	.080	12
13	18.28	23.13	59.56	R	R	R	.0048	.0686	.070	.988	.0050	3.3	1.001	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	1.293 GRAM/KW-HR	(.965	GRAM/BHP-HR)
BSCO ------- =	2.480 GRAM/KW-HR	(1.850	GRAM/BHP-HR)
BSNOX ------ =	9.897 GRAM/KW-HR	(7.383	GRAM/BHP-HR)
BSHC + BSNOX =	11.191 GRAM/KW-HR	(8.348	GRAM/BHP-HR)
CORR. BSFC - =	.264 KG/KW-HR	(.434	LBS/BHP-HR)

TABLE D-6B. ENGINE D6 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DDAD 6V92TA NOZZLE 9B7S NO.1-D FUEL BAROMETER 29.30
TEST D6-2 FUEL: EM-400-F PROJECT:11-5044-001 DATE: 09/26/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 500	0	0.0	.024	4.27	9.2	.959	196	133	1.14	200	24	33	77	1
2	2	INTER / 1200	19	2.4	.063	12.04	9.2	.959	196	106	1.27	106	57	62	97	2
3	25	INTER / 1200	245	30.9	.147	12.82	9.2	.963	164	74	2.66	267	56	49	279	3
4	50	INTER / 1200	492	61.9	.244	13.89	9.2	.966	160	66	4.12	470	59	47	528	4
5	75	INTER / 1200	738	92.7	.356	15.27	9.2	.969	154	186	5.44	768	63	146	955	5
6	100	INTER / 1200	985	123.7	.467	17.05	9.2	.971	130	827	6.41	1000	59	718	1375	6
7		IDLE / 500	0	0.0	.024	4.27	9.2	.959	216	84	.97	170	31	24	76	7
8	100	RATED / 2100	852	187.3	.732	31.09	9.2	.969	170	100	5.34	645	196	165	1684	8
9	75	RATED / 2100	639	140.5	.582	28.75	9.0	.960	168	80	4.53	475	134	124	1150	9
10	50	RATED / 2100	439	96.6	.442	27.14	9.0	.957	174	80	3.67	320	129	116	724	10
11	25	RATED / 2100	213	46.8	.299	24.50	9.0	.954	196	74	2.66	185	135	100	388	11
12	2	RATED / 2100	18	3.9	.171	22.84	9.0	.951	232	93	1.65	93	144	115	178	12
13		IDLE / 500	0	0.0	.027	4.25	9.0	.950	186	80	1.14	210	26	22	90	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	16.92	22.86	53.83	R	R	R	.0056	.0686	.082	.987	.0056	-.9	1.000	R	.067	1
2	15.29	16.44	25.73	24.06	25.87	40.49	.0052	.0686	.076	.986	.0062	18.2	1.008	1.561	.080	2
3	6.28	5.56	31.51	1.80	1.59	9.03	.0116	.0686	.169	.973	.0127	9.6	1.008	.284	.080	3
4	4.02	3.21	36.06	.95	.76	8.54	.0177	.0686	.259	.961	.0195	9.9	1.011	.234	.080	4
5	2.96	6.85	44.74	.68	1.58	10.30	.0235	.0686	.343	.949	.0256	8.9	1.014	.227	.080	5
6	2.12	25.63	49.13	.48	5.80	11.11	.0276	.0686	.403	.941	.0303	9.7	1.017	.222	.080	6
7	21.83	16.94	53.66	R	R	R	.0056	.0686	.081	.989	.0048	-14.4	1.001	R	.067	7
8	3.33	3.76	38.33	.78	.88	8.99	.0238	.0686	.346	.950	.0251	5.7	1.050	.223	.080	8
9	3.85	3.54	32.95	.96	.88	8.18	.0204	.0686	.298	.957	.0214	4.8	1.045	.238	.080	9
10	4.88	4.37	27.28	1.34	1.20	7.49	.0164	.0686	.240	.965	.0174	6.0	1.039	.264	.080	10
11	7.49	5.55	21.62	2.87	2.13	8.29	.0123	.0686	.180	.974	.0127	3.2	1.035	.371	.080	11
12	14.03	11.14	17.30	37.20	29.55	45.86	.0076	.0686	.110	.983	.0080	5.8	1.033	2.567	.080	12
13	16.14	13.83	56.28	R	R	R	.0063	.0686	.092	.988	.0056	-12.1	1.003	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	1.337	GRAM/KW-HR	(.997	GRAM/BHP-HR)
BSCO ------- =	2.169	GRAM/KW-HR	(1.618	GRAM/BHP-HR)
BSNOX ------ =	9.611	GRAM/KW-HR	(7.169	GRAM/BHP-HR)
BSHC + BSNOX =	10.947	GRAM/KW-HR	(8.167	GRAM/BHP-HR)
CORR. BSFC - =	.263	KG/KW-HR	(.433	LBS/BHP-HR)

TABLE D-6C. ENGINE D6 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

TEST D6-3 FUEL: EM-321-F PROJECT: DETROIT 6V92TA DATE: 10/12/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 500	0	0.0	.017	4.34	10.1	1.009	174	60	1.05	180	17	12	59	1
2	2	INTER / 1200	19	2.4	.065	12.24	10.1	1.008	188	66	1.22	95	59	42	99	2
3	25	INTER / 1200	244	30.7	.152	12.78	10.1	1.005	140	33	2.63	245	49	23	281	3
4	50	INTER / 1200	490	61.5	.252	13.73	10.1	1.003	136	40	4.12	444	52	30	541	4
5	75	INTER / 1200	734	92.2	.361	15.15	10.1	1.001	138	106	5.41	717	58	86	951	5
6	100	INTER / 1200	1058	133.0	.511	17.66	10.1	.999	114	962	6.55	1074	56	902	1641	6
7		IDLE / 500	0	0.0	.018	4.34	10.1	1.009	192	33	1.05	179	20	7	61	7
8	100	RATED / 2100	915	201.3	.813	31.12	10.1	1.000	142	119	5.49	692	132	214	2031	8
9	75	RATED / 2100	685	150.6	.643	29.25	10.6	1.008	146	106	4.68	500	126	177	1373	9
10	50	RATED / 2100	457	100.5	.476	27.00	10.6	1.010	162	110	3.80	326	125	167	816	10
11	25	RATED / 2100	228	50.1	.322	24.83	10.6	1.012	178	119	2.75	190	127	168	443	11
12	2	RATED / 2100	18	3.9	.180	22.45	10.6	1.015	210	133	1.66	90	136	173	194	12
13		IDLE / 500	0	0.0	.018	4.34	10.6	1.016	230	133	1.05	180	23	26	59	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	16.41	11.38	56.18	R	R	R	.0040	.0695	.058	.988	.0051	25.4	.996	R	.067	1
2	15.30	10.79	25.54	24.82	17.51	41.46	.0053	.0695	.077	.987	.0059	10.4	1.007	1.611	.080	2
3	5.42	2.54	30.91	1.61	.75	9.16	.0120	.0695	.172	.975	.0124	3.8	1.009	.294	.080	3
4	3.41	1.97	38.75	.84	.48	8.79	.0185	.0695	.267	.963	.0193	4.1	1.012	.243	.080	4
5	2.47	3.97	43.86	.63	.93	10.31	.0241	.0695	.347	.953	.0252	4.7	1.013	.232	.080	5
6	1.82	29.42	53.52	.42	6.78	12.34	.0292	.0695	.421	.943	.0308	5.2	1.021	.226	.080	6
7	18.12	6.24	56.91	R	R	R	.0042	.0695	.061	.988	.0051	19.6	1.000	R	.067	7
8	2.70	4.39	41.67	.45	1.06	10.09	.0264	.0695	.380	.952	.0256	-3.0	1.062	.228	.080	8
9	3.24	4.59	35.60	.83	1.17	9.11	.0222	.0695	.319	.959	.0219	-1.3	1.053	.243	.080	9
10	4.38	5.85	28.59	1.24	1.66	8.12	.0178	.0695	.256	.966	.0179	.5	1.045	.272	.080	10
11	6.57	8.71	22.99	2.53	3.36	8.85	.0131	.0695	.188	.974	.0130	-.3	1.036	.371	.080	11
12	17.40	15.98	17.90	36.15	44.57	49.94	.0080	.0695	.116	.983	.0080	-.6	1.030	2.707	.080	12
13	21.43	24.92	55.94	R	R	R	.0041	.0695	.059	.988	.0051	24.7	.996	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	1.172	GRAM/KW-HR	(.874 GRAM/BHP-HR)
BSCO ------- =	2.444	GRAM/KW-HR	(1.823 GRAM/BHP-HR)
BSNOX ------ =	10.311	GRAM/KW-HR	(7.692 GRAM/BHP-HR)
BSHC + BSNOX =	11.484	GRAM/KW-HR	(8.567 GRAM/BHP-HR)
CORR. BSFC - =	.267	KG/KW-HR	(.439 LBS/BHP-HR)

TABLE D-6D. ENGINE D6 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DDAD 6V92TA NOZZLE 9875 NO.2-D FUEL BAROMETER 29.09
TEST D6-5 FUEL: EM-321-F PROJECT:11-5044-001 DATE: 10/16/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 500	0	0.0	.014	4.07	11.2	1.050	186	106	1.14	190	14	15	48	1
2	2	INTER / 1200	20	2.6	.059	12.05	11.2	1.048	180	106	1.27	99	50	59	94	2
3	25	INTER / 1200	263	33.1	.155	12.94	11.2	1.041	164	80	2.80	260	55	54	296	3
4	50	INTER / 1200	525	66.0	.260	14.03	11.2	1.034	152	90	4.33	475	57	66	584	4
5	75	INTER / 1200	788	99.0	.379	15.50	11.2	1.028	162	212	5.65	768	68	172	1047	5
6	100	INTER / 1200	1051	132.1	.497	17.61	11.2	1.024	134	1044	6.46	988	64	963	1523	6
7		IDLE / 500	0	0.0	.016	4.16	11.2	1.049	224	106	1.10	188	19	18	55	7
8	100	RATED / 2100	917	201.6	.804	30.10	11.0	1.018	158	127	5.49	670	145	226	1982	8
9	75	RATED / 2100	692	152.1	.624	29.47	11.0	1.023	152	106	4.68	490	126	172	1325	9
10	50	RATED / 2100	461	101.4	.471	27.29	11.0	1.026	170	133	3.80	322	130	200	810	10
11	25	RATED / 2100	231	50.7	.315	24.77	11.0	1.030	190	133	2.73	185	133	185	932	11
12	2	RATED / 2100	18	3.9	.185	22.86	11.0	1.034	220	152	1.70	95	143	197	208	12
13		IDLE / 500	0	0.0	.019	4.73	11.0	1.037	200	152	1.12	188	20	30	63	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	16.13	18.45	54.46	R	R	R	.0035	.0695	.050	.986	.0055	59.1	.993	R	.067	1
2	14.06	16.62	26.54	19.45	22.99	36.72	.0049	.0695	.071	.986	.0061	24.0	1.002	1.381	.080	2
3	5.97	5.77	31.82	1.68	1.62	8.94	.0121	.0695	.174	.973	.0133	9.5	1.002	.281	.080	3
4	3.63	4.21	37.46	.86	1.00	8.86	.0187	.0695	.270	.961	.0203	8.3	1.005	.235	.080	4
5	3.00	7.59	44.09	.69	1.74	10.58	.0247	.0695	.356	.950	.0264	6.7	1.008	.228	.080	5
6	2.16	32.31	51.07	.49	7.29	11.53	.0285	.0695	.411	.944	.0304	6.6	1.012	.223	.080	6
7	20.03	19.04	57.83	R	R	R	.0038	.0695	.055	.987	.0054	39.4	.993	R	.067	7
8	3.01	4.68	41.07	.78	1.12	9.83	.0270	.0695	.389	.952	.0256	-5.2	1.053	.227	.080	8
9	3.37	4.59	35.38	.83	1.13	8.71	.0214	.0695	.308	.958	.0219	2.3	1.044	.236	.080	9
10	4.60	7.07	28.65	1.28	1.97	7.99	.0175	.0695	.251	.965	.0179	2.5	1.036	.269	.080	10
11	7.06	9.80	22.91	2.63	3.65	8.53	.0128	.0695	.185	.974	.0130	1.0	1.029	.362	.080	11
12	12.89	17.81	18.78	36.83	50.91	53.67	.0082	.0695	.118	.983	.0082	.2	1.024	2.792	.080	12
13	17.54	26.78	54.07	R	R	R	.0040	.0695	.058	.987	.0055	35.7	.990	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	1.206	GRAM/KW-HR	(.899 GRAM/BHP-HR)
BSCO ------- =	2.786	GRAM/KW-HR	(2.079 GRAM/BHP-HR)
BSNOX ------ =	10.019	GRAM/KW-HR	(7.474 GRAM/BHP-HR)
BSHC + BSNOX =	11.225	GRAM/KW-HR	(8.374 GRAM/BHP-HR)
CORR. BSFC =	.262	KG/KW-HR	(.431 LBS/BHP-HR)

TABLE D-7A. ENGINE D7 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: IH DTI-466B
TEST D7-1 FUEL: EM-321-F PROJECT: 11-5044-001

NO. 2-D FUEL
BAROMETER 29.34
DATE: 10/23/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 724	0	0.0	.014	2.53	4.7	.906	209	190	1.63	275	10	19	41	1
2	2	INTER / 1800	14	2.6	.069	6.77	4.7	.909	324	252	2.39	190	56	87	97	2
3	25	INTER / 1800	163	30.7	.147	7.23	4.7	.915	272	212	4.60	405	54	82	233	3
4	50	INTER / 1800	326	61.4	.249	8.31	4.7	.920	206	133	6.50	652	50	62	455	4
5	75	INTER / 1800	488	92.0	.357	9.67	4.7	.925	142	159	7.93	815	41	87	673	5
6	100	INTER / 1800	646	121.7	.455	11.85	4.7	.925	88	226	8.82	863	29	142	818	6
7		IDLE / 724	0	0.0	.012	2.48	4.7	.906	222	152	1.49	250	11	15	36	7
8	100	RATED / 2600	556	151.4	.639	19.01	4.7	.923	86	212	7.43	671	47	222	1056	8
9	75	RATED / 2600	484	131.8	.552	17.52	4.7	.921	100	146	6.89	632	51	142	927	9
10	50	RATED / 2600	278	75.7	.365	14.38	4.7	.918	148	146	5.65	479	60	115	563	10
11	25	RATED / 2600	206	56.1	.290	13.27	4.7	.916	156	181	4.91	390	57	130	418	11
12	2	RATED / 2600	11	3.0	.125	10.28	4.7	.910	300	279	2.63	152	86	159	129	12
13		IDLE / 724	0	0.0	.015	2.53	4.7	.906	220	212	1.90	233	14	27	43	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	12.41	23.17	49.57	R	R	R	.0055	.0695	.079	.984	.0079	44.2	.977	R	.067	1
2	13.53	20.96	23.93	21.89	33.90	37.90	.0102	.0695	.147	.978	.0115	12.5	.985	1.642	.080	2
3	6.09	9.28	26.47	1.75	2.67	7.60	.0204	.0695	.294	.960	.0217	6.1	.988	.291	.080	3
4	3.33	4.14	30.51	.81	1.01	7.42	.0301	.0695	.433	.946	.0302	.4	.991	.245	.080	4
5	1.91	4.07	31.44	.44	.95	7.32	.0371	.0695	.534	.935	.0366	-1.4	.997	.233	.080	5
6	1.07	5.20	29.97	.24	1.17	6.72	.0386	.0695	.555	.928	.0405	5.0	1.009	.222	.080	6
7	14.75	20.26	49.24	R	R	R	.0049	.0695	.071	.986	.0072	47.0	.983	R	.067	7
8	1.23	5.79	27.57	.31	1.46	6.98	.0338	.0695	.486	.938	.0343	1.7	1.040	.243	.080	8
9	1.53	4.30	27.97	.39	1.08	7.03	.0317	.0695	.456	.943	.0319	.7	1.030	.244	.080	9
10	2.74	5.23	25.71	.79	1.51	7.44	.0255	.0695	.367	.952	.0263	3.2	1.012	.286	.080	10
11	3.29	7.45	23.99	1.02	2.31	7.44	.0220	.0695	.316	.958	.0230	4.6	1.007	.308	.080	11
12	11.43	21.13	17.09	29.12	53.84	43.55	.0123	.0695	.176	.976	.0126	3.0	.997	2.556	.080	12
13	15.45	29.90	48.60	R	R	R	.0059	.0695	.085	.987	.0068	15.8	.977	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.771	GRAM/KW-HR	(.575 GRAM/BHP-HR)
BSCO ------- =	1.759	GRAM/KW-HR	(1.312 GRAM/BHP-HR)
BSNOX ------ =	7.532	GRAM/KW-HR	(5.619 GRAM/BHP-HR)
BSHC + BSNOX =	8.302	GRAM/KW-HR	(6.194 GRAM/BHP-HR)
CORR. BSFC - =	.267	KG/KW-HR	(.439 LBS/BHP-HR)

TABLE D-7B. ENGINE D7 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: IH DTI-466B — NO. 2-D FUEL — BAROMETER 29.26
TEST D7-2 — FUEL: EM-321-F — PROJECT:INTERNATIONAL DTI466B DATE: 10/23/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 722	0	0.0	.013	2.47	4.5	.898	218	199	1.68	270	10	19	37	1
2	2	INTER / 1800	19	2.6	.070	6.68	4.5	.902	350	239	2.13	168	68	93	96	2
3	25	INTER / 1800	163	30.7	.148	7.12	4.5	.909	296	218	4.57	410	59	85	237	3
4	50	INTER / 1800	326	61.4	.247	8.26	4.5	.916	230	133	6.50	660	55	61	455	4
5	75	INTER / 1800	488	92.0	.351	10.05	4.5	.919	142	159	7.99	859	40	85	688	5
6	100	INTER / 1800	646	121.7	.460	11.77	4.2	.919	82	231	8.88	917	27	146	868	6
7		IDLE / 722	0	0.0	.014	2.47	4.2	.890	232	159	4.36	251	5	6	19	7
8	100	RATED / 2600	556	151.4	.648	18.96	4.8	.923	98	179	7.61	692	53	186	1080	8
9	75	RATED / 2600	489	131.8	.554	17.58	5.0	.925	110	112	7.07	667	55	107	960	9
10	50	RATED / 2600	278	75.7	.370	14.34	5.0	.922	166	101	5.77	500	67	79	587	10
11	25	RATED / 2600	206	56.1	.296	13.15	5.0	.920	180	133	5.11	410	65	93	432	11
12	2	RATED / 2600	11	3.0	.125	10.09	5.0	.914	342	226	2.83	170	91	120	134	12
13		IDLE / 722	0	0.0	.015	2.47	5.0	.910	256	154	1.49	250	15	18	93	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	12.87	23.53	96.77	R	R	R	.0053	.0695	.077	.984	.0081	51.8	.982	R	.067	1
2	16.30	22.22	22.98	26.60	36.27	37.50	.0104	.0695	.150	.981	.0103	-1.4	.991	1.647	.080	2
3	6.67	9.60	26.78	1.92	2.77	7.73	.0208	.0695	.300	.961	.0215	3.5	.992	.291	.080	3
4	3.72	4.14	30.71	.90	1.00	7.42	.0300	.0695	.432	.946	.0302	.6	.995	.243	.080	4
5	1.90	4.04	32.71	.43	.92	7.48	.0351	.0695	.504	.934	.0368	5.0	1.003	.228	.080	5
6	.99	5.28	31.42	.23	1.20	7.13	.0393	.0695	.565	.927	.0408	3.8	1.010	.225	.080	6
7	5.49	7.36	16.86	R	R	R	.0056	.0695	.080	.960	.0205	266.7	.984	R	.067	7
8	1.37	4.77	27.77	.35	1.23	7.13	.0344	.0695	.494	.937	.0351	2.2	1.043	.246	.080	8
9	1.65	3.21	28.91	.42	.81	7.28	.0316	.0695	.455	.941	.0327	3.4	1.037	.243	.080	9
10	3.01	3.55	26.41	.88	1.04	7.75	.0260	.0695	.374	.951	.0269	3.5	1.018	.288	.080	10
11	3.66	5.27	24.37	1.16	1.66	7.70	.0226	.0695	.325	.956	.0239	5.8	1.011	.312	.080	11
12	12.15	15.93	17.87	30.87	40.48	45.41	.0125	.0695	.179	.975	.0136	8.8	1.001	2.539	.080	12
13	16.96	20.47	49.36	R	R	R	.0059	.0695	.085	.986	.0072	21.8	.982	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.833	GRAM/KW-HR	(.622 GRAM/BHP-HR)
BSCO ------- =	1.500	GRAM/KW-HR	(1.119 GRAM/BHP-HR)
BSNOX ------ =	7.732	GRAM/KW-HR	(5.768 GRAM/BHP-HR)
BSHC + BSNOX =	8.565	GRAM/KW-HR	(6.390 GRAM/BHP-HR)
CORR. BSFC - =	.268	KG/KW-HR	(.440 LBS/BHP-HR)

TABLE D-8A. ENGINE D9 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: MACK ETAZ(B)673A — NO. 2 FUEL — BAROMETER 29.21
TEST D9-1 — FUEL: EM-321-F — PROJECT: 11-5044-001 — DATE: 12/10/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 650	0	0.0	.020	3.17	12.2	1.077	346	289	1.49	275	27	45	76	1
2	2	INTER / 1450	27	4.1	.069	8.28	12.2	1.074	364	212	1.87	202	79	92	154	2
3	25	INTER / 1450	353	53.5	.212	9.65	12.2	1.053	336	159	5.11	525	87	80	452	3
4	50	INTER / 1450	705	107.1	.385	11.92	12.2	1.037	258	165	7.52	935	84	103	985	4
5	75	INTER / 1450	1058	160.6	.581	14.89	12.2	1.027	106	292	8.73	1029	45	236	1396	5
6	100	INTER / 1450	1404	213.2	.782	17.81	12.2	1.020	66	365	9.79	1050	34	355	1699	6
7		IDLE / 650	0	0.0	.017	3.17	12.2	1.079	292	186	1.54	295	19	29	68	7
8	100	RATED / 1900	1173	233.4	.937	24.08	12.2	1.027	65	312	8.58	780	46	415	1737	8
9	75	RATED / 1900	854	170.0	.670	20.18	12.2	1.036	112	239	7.34	665	65	265	1248	9
10	50	RATED / 1900	587	116.9	.464	16.75	12.2	1.044	224	106	6.25	530	105	96	815	10
11	25	RATED / 1900	293	58.3	.279	13.50	12.2	1.055	298	132	4.60	320	112	97	909	11
12	2	RATED / 1900	23	4.6	.112	11.45	12.2	1.072	412	191	2.15	125	128	118	135	12
13		IDLE / 650	0	0.0	.018	3.27	12.2	1.079	416	266	1.36	250	32	91	68	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	28.63	37.86	63.34	R	R	R	.0063	.0695	.091	.984	.0073	15.7	.988	R	.067	1
2	19.25	22.38	37.39	14.28	22.43	37.46	.0084	.0695	.121	.981	.0091	8.1	.995	1.007	.080	2
3	6.82	6.27	35.58	1.62	1.49	8.44	.0222	.0695	.319	.954	.0240	8.1	.997	.238	.080	3
4	3.65	4.44	42.59	.79	.96	9.19	.0327	.0695	.471	.936	.0348	6.4	1.001	.216	.080	4
5	1.30	6.78	40.04	.28	1.47	8.69	.0395	.0695	.569	.927	.0401	1.6	1.010	.215	.080	5
6	.73	7.96	36.19	.16	1.66	7.97	.0445	.0695	.640	.919	.0448	.8	1.021	.216	.080	6
7	18.71	23.84	66.59	R	R	R	.0054	.0695	.078	.983	.0075	38.2	.989	R	.067	7
8	.81	7.37	30.89	.20	1.78	7.44	.0394	.0695	.567	.928	.0395	.2	1.047	.230	.080	8
9	1.62	6.60	31.03	.38	1.56	7.34	.0336	.0695	.484	.937	.0340	.9	1.029	.230	.080	9
10	3.77	3.43	29.26	.90	.82	6.97	.0280	.0695	.404	.946	.0291	3.6	1.014	.235	.080	10
11	6.49	5.99	29.15	1.98	1.66	6.93	.0209	.0695	.301	.959	.0216	3.4	1.003	.286	.080	11
12	19.04	17.59	20.13	29.82	25.69	29.42	.0099	.0695	.142	.979	.0104	5.4	.997	1.466	.080	12
13	29.57	37.90	62.71	R	R	R	.0056	.0695	.081	.985	.0067	20.1	.983	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.759	GRAM/KW-HR	(.566	GRAM/BHP-HR)
BSCO ------- =	1.737	GRAM/KW-HR	(1.296	GRAM/BHP-HR)
BSNOX ------ =	8.203	GRAM/KW-HR	(6.120	GRAM/BHP-HR)
BSHC + BSNOX =	8.962	GRAM/KW-HR	(6.686	GRAM/BHP-HR)
CORR. BSFC - =	.238	KG/KW-HR	(.391	LBS/BHP-HR)

TABLE D-8B. ENGINE D9 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: MACK ETAZ(B)673A — NO. 2 FUEL — BAROMETER 29.21
TEST D9-2 — FUEL: EM-321-F — PROJECT: 11-5044-001 — DATE: 12/10/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 650	0	0.0	.020	3.24	12.4	1.075	314	292	1.56	310	24	44	82	1
2	2	INTER / 1450	27	4.1	.067	8.16	12.4	1.072	334	226	1.83	195	73	99	149	2
3	25	INTER / 1450	353	53.5	.212	9.59	12.4	1.053	332	173	5.00	510	88	89	449	3
4	50	INTER / 1450	705	107.1	.390	12.03	12.4	1.039	244	192	7.43	895	82	122	967	4
5	75	INTER / 1450	1058	160.6	.578	15.06	12.4	1.031	106	306	8.68	1020	45	248	1389	5
6	100	INTER / 1450	1411	214.2	.782	17.84	12.4	1.024	64	385	9.72	1056	33	377	1725	6
7		IDLE / 650	0	0.0	.020	3.19	12.4	1.075	280	212	1.54	300	21	32	80	7
8	100	RATED / 1900	1173	233.4	.930	24.00	12.4	1.030	71	306	8.48	790	50	408	1772	8
9	75	RATED / 1900	854	170.0	.670	20.37	12.4	1.038	116	212	7.30	640	68	236	1209	9
10	50	RATED / 1900	587	116.9	.464	16.76	12.4	1.045	212	100	6.25	515	99	90	793	10
11	25	RATED / 1900	293	58.3	.283	13.51	12.4	1.054	326	124	4.57	310	125	93	399	11
12	2	RATED / 1900	23	4.6	.102	11.63	12.4	1.071	416	166	2.16	122	117	93	119	12
13		IDLE / 650	0	0.0	.020	3.19	12.4	1.075	368	345	1.36	250	31	58	74	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	19.71	36.67	68.30	R	R	R	.0063	.0695	.090	.983	.0076	22.2	.986	R	.067	1
2	18.05	24.39	36.81	17.70	23.92	36.11	.0084	.0695	.120	.981	.0089	6.5	.991	.990	.080	2
3	6.88	6.97	35.31	1.63	1.66	8.39	.0224	.0695	.322	.955	.0235	4.9	.993	.239	.080	3
4	3.49	5.23	41.32	.76	1.14	9.03	.0328	.0695	.472	.936	.0344	4.8	1.000	.218	.080	4
5	1.31	7.14	40.05	.28	1.54	8.65	.0389	.0695	.560	.927	.0399	2.7	1.010	.214	.080	5
6	.71	8.03	36.78	.16	1.76	8.05	.0444	.0695	.639	.919	.0445	.3	1.022	.214	.080	6
7	19.92	27.15	67.40	R	R	R	.0063	.0695	.090	.983	.0075	19.8	.986	R	.067	7
8	.90	7.31	31.74	.21	1.75	7.59	.0393	.0695	.565	.929	.0390	-.6	1.046	.229	.080	8
9	1.69	5.89	30.10	.40	1.39	7.11	.0333	.0695	.479	.937	.0338	1.4	1.028	.230	.080	9
10	3.57	3.24	28.46	.85	.77	6.79	.0280	.0695	.404	.946	.0291	3.6	1.014	.235	.080	10
11	9.37	5.47	23.52	2.14	1.59	6.84	.0212	.0695	.305	.959	.0215	1.5	1.002	.240	.080	11
12	19.17	15.23	19.57	25.49	20.25	26.02	.0088	.0695	.127	.978	.0104	18.1	.997	1.333	.080	12
13	26.10	49.06	62.36	R	R	R	.0063	.0695	.090	.985	.0068	7.7	.983	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.751	GRAM/KW-HR	(.561 GRAM/BHP-HR)
BSCO ------- =	1.752	GRAM/KW-HR	(1.307 GRAM/BHP-HR)
BSNOX ------ =	8.167	GRAM/KW-HR	(6.092 GRAM/BHP-HR)
BSHC + BSNOX =	8.918	GRAM/KW-HR	(6.653 GRAM/BHP-HR)
CORR. BSFC - =	.237	KG/KW-HR	(.390 LBS/BHP-HR)

TABLE D-9A. ENGINE D10 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: MACK ETSX 676-0-1 — NO. 2 FUEL — BAROMETER 29.25
TEST D10-1 — FUEL: EM-321-F — PROJECT:11-5044-001 — DATE: 12/19/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 575	0	0.0	.022	2.86	9.0	.965	104	151	1.55	135	9	26	37	1
2	2	INTER / 1260	30	3.9	.056	7.07	9.0	.965	216	130	1.83	115	40	48	67	2
3	25	INTER / 1260	305	40.3	.162	7.78	9.0	.970	166	188	4.83	274	35	76	176	3
4	50	INTER / 1260	746	98.4	.362	10.42	9.0	.975	113	307	8.28	525	32	163	444	4
5	75	INTER / 1260	1051	138.7	.509	12.81	9.0	.977	61	504	9.51	565	21	328	586	5
6	100	INTER / 1260	1546	204.0	.752	16.22	9.0	.980	25	480	10.37	600	12	423	845	6
7		IDLE / 575	0	0.0	.021	2.85	9.0	.964	100	128	1.38	125	9	23	35	7
8	100	RATED / 2100	1031	226.7	.928	25.22	9.0	.976	50	326	8.11	472	37	453	1045	8
9	75	RATED / 2100	773	170.0	.698	22.99	9.0	.973	88	263	6.55	413	59	341	850	9
10	50	RATED / 2100	515	113.3	.509	20.20	9.0	.971	132	339	5.36	298	78	390	543	10
11	25	RATED / 2100	258	56.7	.319	16.85	9.0	.969	162	186	3.92	263	81	183	409	11
12	2	RATED / 2100	20	4.5	.150	13.87	9.0	.966	212	161	2.31	138	83	126	170	12
13		IDLE / 575	0	0.0	.020	2.84	9.0	.964	137	119	1.54	172	11	19	43	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	6.70	19.51	27.45	R	R	R	.0078	.0695	.113	.985	.0074	-5.3	.992	R	.067	1
2	11.80	14.19	19.76	10.12	12.18	16.96	.0080	.0695	.116	.982	.0088	9.3	.993	.865	.080	2
3	3.56	7.87	18.14	.86	1.90	4.37	.0210	.0695	.302	.957	.0226	8.0	.994	.242	.080	3
4	1.46	7.51	20.43	.32	1.66	4.51	.0351	.0695	.504	.931	.0382	8.9	1.001	.220	.080	4
5	.69	10.73	19.17	.15	2.36	4.22	.0401	.0695	.578	.921	.0436	8.7	1.008	.219	.080	5
6	.26	9.38	18.74	.06	2.07	4.14	.0467	.0695	.673	.915	.0474	1.3	1.018	.217	.080	6
7	7.23	18.58	28.54	R	R	R	.0073	.0695	.105	.986	.0066	-9.2	.990	R	.067	7
8	.66	8.15	18.78	.16	2.00	4.61	.0371	.0695	.534	.932	.0374	.7	1.051	.234	.080	8
9	1.42	8.13	20.28	.35	2.00	5.00	.0307	.0695	.441	.944	.0304	-.8	1.040	.237	.080	9
10	2.56	12.76	17.78	.69	3.44	4.79	.0254	.0695	.366	.953	.0251	-1.2	1.028	.262	.080	10
11	4.24	9.57	21.40	1.43	3.23	7.23	.0191	.0695	.275	.965	.0185	-3.3	1.014	.333	.080	11
12	9.23	13.96	18.86	18.57	28.08	37.92	.0109	.0695	.157	.978	.0110	1.2	1.005	2.001	.080	12
13	8.89	15.47	35.19	R	R	R	.0072	.0695	.104	.985	.0074	2.0	.987	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.475	GRAM/KW-HR	(.354	GRAM/BHP-HR)
BSCO ------- =	2.449	GRAM/KW-HR	(1.827	GRAM/BHP-HR)
BSNOX ------ =	4.951	GRAM/KW-HR	(3.693	GRAM/BHP-HR)
BSHC + BSNOX =	5.425	GRAM/KW-HR	(4.047	GRAM/BHP-HR)
CORR. BSFC - =	.249	KG/KW-HR	(.410	LBS/BHP-HR)

TABLE D-9B. ENGINE D10 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: MACK ETSX 676-D-1 — NO. 2 FUEL — BAROMETER 29.25
TEST D10-2 — FUEL: EM-321-F — PROJECT:11-5044-001 — DATE: 12/20/79

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 575	0	0.0	.021	2.85	6.5	.914	103	86	1.52	158	9	14	34	1
2	2	INTER / 1200	31	3.9	.057	6.70	6.5	.915	190	85	1.87	136	35	31	74	2
3	25	INTER / 1200	305	38.4	.162	7.28	6.5	.928	171	157	4.79	138	36	64	86	3
4	50	INTER / 1200	746	93.7	.352	9.39	6.5	.942	112	215	8.06	563	31	114	460	4
5	75	INTER / 1200	1051	132.1	.491	11.45	6.5	.947	62	372	9.10	612	22	244	621	5
6	100	INTER / 1200	1546	194.3	.728	15.04	7.0	.957	28	412	10.50	590	13	347	777	6
7		IDLE / 575	0	0.0	.022	2.90	7.0	.932	96	134	1.51	159	8	23	42	7
8	100	RATED / 2100	1031	226.7	.920	22.84	7.0	.952	58	399	8.23	575	42	542	1213	8
9	75	RATED / 2100	773	170.0	.697	22.65	7.0	.946	86	343	6.72	473	56	432	919	9
10	50	RATED / 2100	515	113.3	.501	20.00	7.0	.942	119	266	5.49	340	68	294	579	10
11	25	RATED / 2100	258	56.7	.311	16.64	7.0	.939	152	319	4.09	232	71	293	327	11
12	2	RATED / 2100	20	4.5	.148	13.80	7.0	.934	200	162	2.30	120	78	125	142	12
13		IDLE / 575	0	0.0	.020	2.87	7.0	.932	122	119	1.54	145	10	19	35	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	6.79	11.38	31.18	R	R	R	.0074	.0695	.107	.985	.0073	-2.5	.990	R	.067	1
2	10.19	9.12	21.79	8.84	7.91	18.90	.0085	.0695	.123	.982	.0089	5.0	.995	.872	.080	2
3	3.70	6.63	8.82	.94	1.68	2.23	.0224	.0695	.322	.959	.0224	.3	1.002	.253	.080	3
4	1.48	5.41	21.77	.33	1.22	4.91	.0378	.0695	.544	.933	.0371	-1.7	1.008	.224	.080	4
5	.73	8.28	21.06	.16	1.85	4.70	.0432	.0695	.621	.925	.0418	-3.2	1.015	.220	.080	5
6	.29	7.96	17.79	.07	1.79	4.00	.0487	.0695	.701	.915	.0479	-1.7	1.017	.221	.080	6
7	6.35	17.29	32.11	R	R	R	.0076	.0695	.109	.986	.0072	-4.9	.994	R	.067	7
8	.75	9.82	21.47	.18	2.39	5.35	.0405	.0695	.583	.932	.0380	-6.4	1.062	.229	.080	8
9	1.35	10.33	21.98	.33	2.54	5.40	.0310	.0695	.446	.943	.0312	.8	1.043	.236	.080	9
10	2.26	9.79	19.25	.60	2.60	5.10	.0252	.0695	.363	.953	.0257	1.8	1.029	.258	.080	10
11	3.81	15.20	17.48	1.24	5.18	5.76	.0188	.0695	.271	.964	.0193	2.5	1.014	.325	.080	11
12	8.75	14.12	15.93	17.37	28.04	31.65	.0108	.0695	.155	.979	.0110	1.7	1.006	1.976	.080	12
13	7.92	15.49	28.69	R	R	R	.0072	.0695	.103	.985	.0074	3.2	.987	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.458	GRAM/KW-HR	(.342	GRAM/BHP-HR)
BSCO ------- =	2.453	GRAM/KW-HR	(1.830	GRAM/BHP-HR)
BSNOX ------ =	5.122	GRAM/KW-HR	(3.821	GRAM/BHP-HR)
BSHC + BSNOX =	5.580	GRAM/KW-HR	(4.163	GRAM/BHP-HR)
CORR. BSFC - =	.249	KG/KW-HR	(.410	LBS/BHP-HR)

TABLE D-10A. ENGINE D11 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

CUMMINS VTB-903 — NO. 2 FUEL — BAROMETER 29.17
TEST D11-1 — FUEL: EM-321-F — PROJECT: 11-5044-001 — DATE: 01/29/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 660	0	0.0	.022	5.16	8.8	.967	348	173	1.07	49	41	41	18	1
2	2	INTER / 1500	24	3.8	.091	12.24	8.8	.968	528	235	1.52	51	182	163	56	2
3	25	INTER / 1500	258	40.5	.201	12.53	8.8	.970	140	153	3.45	175	50	108	195	3
4	50	INTER / 1500	529	83.1	.330	13.07	8.8	.972	92	139	5.53	490	34	101	565	4
5	75	INTER / 1500	773	121.4	.427	13.56	8.8	.973	77	199	7.34	950	29	141	1068	5
6	100	INTER / 1500	1031	161.9	.587	14.09	8.8	.976	56	774	9.37	1539	23	587	1857	6
7		IDLE / 660	0	0.0	.023	5.13	8.8	.967	344	205	1.10	51	41	49	19	7
8	100	RATED / 2100	895	196.9	.744	21.93	8.8	.974	130	156	7.49	1263	82	188	2425	8
9	75	RATED / 2100	604	132.7	.516	20.18	8.8	.972	82	133	5.73	633	46	146	1101	9
10	50	RATED / 2100	448	98.4	.430	19.43	8.8	.971	92	138	4.75	260	52	152	453	10
11	25	RATED / 2100	156	34.3	.249	18.14	8.8	.969	152	186	2.92	124	79	192	202	11
12	2	RATED / 2100	11	2.4	.177	17.63	8.8	.968	284	212	2.00	65	150	223	108	12
13		IDLE / 660	0	0.0	.021	5.06	8.8	.967	324	190	1.12	48	36	42	17	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	31.33	31.38	14.02	R	R	R	.0043	.0695	.062	.988	.0053	23.8	.989	R	.067	1
2	33.58	29.96	10.27	47.57	42.44	14.54	.0075	.0695	.107	.985	.0075	1.0	1.004	1.410	.080	2
3	4.15	8.95	16.20	1.24	2.66	4.82	.0162	.0695	.233	.969	.0163	.8	1.006	.296	.080	3
4	1.74	5.10	28.49	.42	1.22	6.79	.0255	.0695	.367	.952	.0258	1.0	1.008	.237	.080	4
5	1.11	5.50	41.69	.24	1.16	8.80	.0318	.0695	.457	.938	.0339	6.7	1.011	.209	.080	5
6	.64	16.67	52.77	.14	3.62	11.47	.0420	.0695	.604	.922	.0432	2.8	1.013	.214	.080	6
7	30.14	36.13	14.18	R	R	R	.0045	.0695	.064	.988	.0055	22.6	.990	R	.067	7
8	1.85	4.22	54.34	.42	.96	12.32	.0342	.0695	.492	.937	.0346	1.1	1.051	.216	.080	8
9	1.50	4.71	35.53	.35	1.10	8.29	.0258	.0695	.371	.951	.0267	3.3	1.041	.224	.080	9
10	2.01	5.89	17.57	.53	1.54	4.61	.0223	.0695	.321	.958	.0222	-.5	1.037	.253	.080	10
11	5.29	12.82	13.51	2.31	5.59	5.90	.0139	.0695	.200	.973	.0139	-.1	1.029	.424	.080	11
12	14.12	21.05	10.20	62.82	93.63	45.36	.0101	.0695	.146	.981	.0097	-4.6	1.026	4.336	.080	12
13	28.00	33.01	13.16	R	R	R	.0042	.0695	.061	.988	.0055	31.4	.987	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.944	GRAM/KW-HR	(.704 GRAM/BHP-HR)
BSCO ------- =	2.412	GRAM/KW-HR	(1.799 GRAM/BHP-HR)
BSNOX ------ =	9.224	GRAM/KW-HR	(6.881 GRAM/BHP-HR)
BSHC + BSNOX =	10.169	GRAM/KW-HR	(7.586 GRAM/BHP-HR)
CORR. BSFC - =	.254	KG/KW-HR	(.417 LBS/BHP-HR)

TABLE D-10B. ENGINE D11 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

CUMMINS VTB-903 — NO. 2 FUEL — BAROMETER 29.20
TEST D11-2 — FUEL: EM-321-F — PROJECT:11-5044-001 — DATE: 01/29/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 660	0	0.0	.024	5.02	8.8	.996	332	133	1.14	50	41	33	20	1
2	2	INTER / 1500	24	3.8	.091	12.05	8.8	.994	524	173	1.51	50	183	121	57	2
3	25	INTER / 1500	258	40.5	.197	12.92	8.8	.991	150	93	3.42	168	53	65	189	3
4	50	INTER / 1500	529	83.1	.329	12.96	8.8	.986	96	80	5.52	485	36	58	566	4
5	75	INTER / 1500	773	121.4	.431	13.44	8.8	.983	78	133	7.25	915	30	96	1062	5
6	100	INTER / 1500	1031	161.9	.586	14.02	8.8	.979	56	653	9.40	1532	23	493	1848	6
7		IDLE / 660	0	0.0	.022	5.04	8.8	.996	352	146	1.10	50	41	34	19	7
8	100	RATED / 2100	895	196.9	.748	21.62	9.0	.983	120	164	7.40	1266	77	202	2495	8
9	75	RATED / 2100	609	132.7	.519	20.05	9.0	.985	85	119	5.70	630	49	132	1121	9
10	50	RATED / 2100	448	98.4	.435	19.39	9.0	.986	95	119	4.80	260	54	131	461	10
11	25	RATED / 2100	156	34.3	.252	17.90	9.3	.986	152	146	2.94	130	80	152	217	11
12	2	RATED / 2100	11	2.4	.178	17.43	9.3	.987	300	186	1.97	70	161	200	121	12
13		IDLE / 660	0	0.0	.023	4.94	8.8	.981	348	173	1.10	50	42	42	19	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	28.32	22.81	13.93	R	R	R	.0049	.0695	.070	.988	.0056	15.4	.990	R	.067	1
2	33.67	22.29	10.45	47.77	31.62	14.83	.0076	.0695	.109	.985	.0075	-1.7	1.006	1.411	.080	2
3	4.49	5.50	16.05	1.31	1.60	4.67	.0160	.0695	.230	.969	.0161	1.0	1.007	.289	.080	3
4	1.82	2.94	28.69	.93	.70	6.81	.0256	.0695	.368	.952	.0257	.3	1.010	.235	.080	4
5	1.14	3.72	41.10	.24	.79	8.75	.0323	.0695	.465	.939	.0335	3.6	1.013	.210	.080	5
6	.64	14.04	52.59	.14	3.05	11.42	.0422	.0695	.607	.922	.0432	2.5	1.018	.213	.080	6
7	30.98	25.84	14.38	R	R	R	.0044	.0695	.063	.988	.0054	24.1	.991	R	.067	7
8	1.72	4.49	55.63	.39	1.02	12.67	.0349	.0695	.502	.938	.0342	-2.0	1.055	.216	.080	8
9	1.56	4.24	36.05	.37	.99	8.45	.0261	.0695	.376	.951	.0265	1.6	1.047	.224	.080	9
10	2.06	5.02	17.67	.54	1.33	4.68	.0226	.0695	.325	.958	.0224	-.8	1.041	.254	.080	10
11	5.26	10.01	14.34	2.32	4.42	6.33	.0142	.0695	.205	.973	.0139	-2.1	1.034	.427	.080	11
12	15.14	18.75	11.36	67.64	83.76	50.76	.0103	.0695	.148	.981	.0095	-7.5	1.030	4.336	.080	12
13	30.57	30.56	14.14	R	R	R	.0046	.0695	.067	.988	.0054	17.7	.992	R	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.969	GRAM/KW-HR	(.723 GRAM/BHP-HR)
BSCO ------- =	1.988	GRAM/KW-HR	(1.483 GRAM/BHP-HR)
BSNOX ------ =	9.352	GRAM/KW-HR	(6.977 GRAM/BHP-HR)
BSHC + BSNOX =	10.321	GRAM/KW-HR	(7.699 GRAM/BHP-HR)
CORR. BSFC - =	.254	KG/KW-HR	(.417 LBS/BHP-HR)

TABLE D-11A. ENGINE D12 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE:CAT 3406 DITA — NO. 2 FUEL — BAROMETER 28.88
TEST NO. D12-1 — FUEL: EM-40H-F — PROJECT:11-5044-C01 — DATE: 03/12/80

MODE	PERCENT SPEED	ENGINE SPEED	TORQUE LBS FT N X M	POWER LBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 700.	0.	.0	.021	4.94	5.2	.893	116.	252.	1.05	350.	14.	60.	121.	1
2	2	INTER / 1260.	39.	5.2	.071	8.95	5.2	.897	192.	298.	2.16	380.	38.	117.	218.	2
3	25	INTER / 1260.	430.	56.7	.212	9.62	5.2	.911	180.	292.	5.19	940.	46.	144.	690.	3
4	50	INTER / 1260.	861.	113.6	.415	11.23	5.2	.926	132.	465.	8.18	1320.	43.	286.	1227.	4
5	75	INTER / 1260.	1291.	170.4	.615	13.26	5.2	.936	66.	1318.	10.16	1350.	26.	961.	1504.	5
6	100	INTER / 1260.	1722.	227.3	.844	15.97	5.2	.944	28.	1753.	11.44	1170.	13.	1556.	1599.	6
7		IDLE / 700.	0.	.0	.022	4.94	5.2	.893	126.	292.	.89	1110.	18.	84.	466.	7
8	100	RATED / 2100.	1343.	295.3	1.073	26.07	5.2	.931	62.	385.	8.70	1020.	49.	577.	2323.	8
9	75	RATED / 2100.	1006.	221.3	.805	22.48	5.2	.925	66.	298.	7.80	1035.	43.	374.	1961.	9
10	50	RATED / 2100.	671.	147.7	.581	19.02	5.2	.920	94.	292.	6.63	925.	52.	311.	1477.	10
11	25	RATED / 2100.	335.	73.7	.369	15.87	5.4	.918	126.	372.	4.89	625.	59.	339.	854.	11
12	2	RATED / 2100.	26.	5.7	.155	14.32	5.2	.899	206.	385.	2.33	300.	82.	305.	349.	12
13		IDLE / 700.	0.	.0	.023	4.90	5.2	.893	130.	263.	1.01	325.	17.	69.	125.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	"PHI"	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	PEDAL WEIGHT FACTOR	MODE
1	10.79	47.66	95.52	******	******	*****	.0043	.0695	.062	.989	.0051	19.7	1.010	*****	.067	1
2	5.84	27.48	51.23	7.29	22.56	42.08	.0080	.0695	.115	.980	.0104	30.3	1.011	.812	.080	2
3	3.66	11.25	54.36	.81	2.54	12.15	.0221	.0695	.318	.956	.0243	10.0	1.014	.221	.080	3
4	1.62	11.48	49.38	.36	2.52	10.80	.0371	.0695	.534	.932	.0378	1.8	1.017	.215	.080	4
5	.70	28.09	40.78	.15	5.64	8.82	.0466	.0695	.670	.917	.0469	.6	1.022	.212	.080	5
6	.27	36.22	31.57	.06	8.85	7.64	.0532	.0695	.765	.908	.0526	-1.0	1.029	.217	.080	6
7	13.65	63.79	******	******	******	******	.0045	.0695	.064	.991	.0044	-1.6	1.008	*****	.067	7
8	.77	8.98	38.07	.17	1.95	7.87	.0414	.0695	.596	.929	.0400	-3.3	1.073	.203	.080	8
9	.50	7.24	40.54	.20	1.69	8.86	.0360	.0695	.518	.935	.0360	.0	1.057	.206	.080	9
10	1.49	8.41	42.47	.35	2.10	10.00	.0307	.0695	.442	.944	.0308	.3	1.043	.226	.080	10
11	2.69	15.33	38.52	.80	4.61	11.59	.0234	.0695	.336	.958	.0230	-1.6	1.030	.292	.080	11
12	8.51	32.60	34.51	14.45	53.81	61.54	.0109	.0695	.157	.979	.0112	3.3	1.024	1.602	.080	12
13	12.52	51.62	91.90	******	******	*****	.0046	.0695	.067	.990	.0050	6.8	1.008	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.373	GRAM/KW-HR	(.279 GRAM/BHP-HR)
BSCO ------- =	3.910	GRAM/KW-HR	(2.917 GRAM/BHP-HR)
BSNOX ------ =	9.718	GRAM/KW-HR	(7.250 GRAM/BHP-HR)
BSHC + BSNOX =	10.092	GRAM/KW-HR	(7.528 GRAM/BHP-HR)
CORR. BSFC =	.227	KG/KW-HR	(.373 LBS/BHP-HR)

TABLE D-11B. ENGINE D12 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE:CAT 3406 DITA — NO. 2 FUEL — BAROMETER 28.80
TEST NO. D12-2 — FUEL: EM-408-F — PROJECT:11-5044-001 — DATE: 03/12/80

MODE	% SPEED	ENGINE SPEED RPM	% TORQUE	POWER GBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 700.	0.	.0	.023	4.95	4.5	.869	132.	266.	1.05	340.	17.	68.	123.	1
2	2	INTER / 1200.	39.	5.2	.078	8.81	4.5	.875	188.	359.	1.87	370.	46.	177.	261.	2
3	25	INTER / 1200.	438.	58.7	.227	9.54	4.5	.896	170.	356.	5.34	950.	45.	183.	713.	3
4	50	INTER / 1200.	841.	113.6	.412	10.96	4.5	.916	132.	479.	8.18	1320.	42.	292.	1205.	4
5	75	INTER / 1200.	1241.	170.4	.612	13.23	4.5	.929	66.	1456.	10.41	1350.	25.	1031.	1450.	5
6	100	INTER / 1200.	1722.	227.3	.844	15.93	4.5	.940	30.	1767.	11.59	1200.	14.	1547.	1611.	6
7		IDLE / 700.	0.	.0	.024	4.82	4.5	.869	128.	345.	1.18	1200.	15.	83.	410.	7
8	100	RATED / 2100.	1343.	295.3	1.073	26.08	4.5	.921	60.	399.	8.68	1020.	48.	600.	2304.	8
9	75	RATED / 2100.	1006.	221.3	.797	22.75	4.5	.912	66.	319.	7.72	1050.	43.	401.	1962.	9
10	50	RATED / 2100.	671.	147.7	.568	19.16	4.5	.904	92.	305.	6.55	920.	50.	321.	1428.	10
11	25	RATED / 2100.	332.	73.7	.369	15.97	4.5	.895	132.	399.	4.82	600.	63.	369.	810.	11
12	2	RATED / 2100.	26.	5.7	.147	14.34	4.5	.877	216.	425.	1.78	261.	105.	415.	364.	12
13		IDLE / 700.	0.	.0	.024	4.92	4.5	.869	148.	319.	.97	335.	21.	91.	136.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	"PHI"	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	1.224	46.69	96.05	******	******	*****	.0046	.0695	.066	.990	.0052	12.0	1.014	*****	.067	1
2	3.54	37.67	85.89	3.95	34.17	50.27	.0089	.0695	.128	.983	.0091	2.1	1.016	.886	.080	2
3	3.30	13.44	52.42	.79	3.22	12.57	.0239	.0695	.344	.955	.0250	4.9	1.017	.236	.080	3
4	1.42	11.83	46.44	.37	2.57	10.60	.0378	.0695	.544	.933	.0378	.1	1.019	.213	.080	4
5	.68	10.86	39.96	.15	6.05	8.51	.0465	.0695	.669	.916	.0480	3.3	1.026	.210	.080	5
6	.29	8.54	31.23	.06	1.81	7.09	.0532	.0695	.765	.907	.0533	.2	1.032	.216	.080	6
7	10.55	37.23	*****	******	******	*****	.0050	.0695	.072	.988	.0058	15.1	1.019	*****	.067	7
8	.24	9.31	35.78	.10	2.03	7.80	.0413	.0695	.595	.929	.0399	-3.4	1.073	.203	.080	8
9	.91	8.37	41.62	.20	1.81	8.87	.0352	.0695	.507	.936	.0357	1.3	1.058	.204	.080	9
10	1.42	9.42	41.04	.34	2.17	9.67	.0298	.0695	.428	.945	.0304	2.2	1.043	.221	.080	10
11	3.83	10.67	36.59	.85	5.01	10.99	.0232	.0695	.334	.959	.0227	-2.2	1.033	.291	.080	11
12	11.61	47.21	91.21	10.98	73.20	64.31	.0103	.0695	.149	.984	.0087	-15.8	1.027	1.520	.080	12
13	14.76	43.07	95.14	******	******	*****	.0049	.0695	.070	.990	.0048	-1.0	1.011	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSPL ------- =	.400	GRAM/KW-HR	(.298 GRAM/BHP-HR)
BSEC ------- =	4.205	GRAM/KW-HR	(3.137 GRAM/BHP-HR)
BSNOX ------ =	9.620	GRAM/KW-HR	(7.177 GRAM/BHP-HR)
BSPC + BSNOX =	10.020	GRAM/KW-HR	(7.475 GRAM/BHP-HR)
BSFC. BSFC - =	.226	KG/KW-HR	(.372 LBS/BHP-HR)

TABLE D-12A. ENGINE D13 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE:CATERPILLAR 3406 PCTA — NO. 2 FUEL — BAROMETER 29.15
TEST NO.D13-1 — FUEL: EM-408-F — PROJECT:11-5044-001 — DATE: 03/20/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 600.	0.	.0	.028	4.28	2.5	.842	68.	399.	1.52	126.	7.	86.	37.	1
2	2	INTER / 1260.	33.	4.3	.081	8.53	2.5	.847	96.	447.	1.87	126.	25.	229.	89.	2
3	25	INTER / 1260.	407.	53.7	.232	9.04	2.5	.873	46.	186.	4.96	635.	13.	106.	514.	3
4	50	INTER / 1260.	814.	107.4	.422	11.78	2.5	.890	48.	218.	7.37	675.	17.	152.	683.	4
5	75	INTER / 1260.	1221.	161.1	.639	15.11	2.5	.901	38.	420.	8.48	615.	18.	385.	829.	5
6	100	INTER / 1260.	1600.	211.2	.835	18.62	2.5	.906	20.	492.	9.77	610.	11.	511.	937.	6
7		IDLE / 600.	0.	.0	.028	4.26	2.5	.842	56.	399.	1.52	132.	6.	86.	39.	7
8	100	RATED / 2100.	1309.	287.8	1.150	29.58	2.3	.892	56.	207.	8.13	800.	51.	357.	2006.	8
9	75	RATED / 2100.	981.	215.7	.861	25.37	2.3	.883	50.	167.	7.30	765.	38.	240.	1583.	9
10	50	RATED / 2100.	654.	143.8	.607	20.47	2.1	.870	52.	186.	6.29	740.	32.	218.	1233.	10
11	25	RATED / 2100.	327.	71.9	.351	16.29	2.1	.855	80.	276.	4.85	575.	36.	242.	703.	11
12	2	RATED / 2100.	26.	5.7	.173	14.66	2.1	.837	72.	332.	2.50	216.	30.	276.	246.	12
13		IDLE / 600.	0.	.0	.027	4.25	2.1	.828	80.	425.	1.48	117.	9.	93.	35.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	"PHI"	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	4.40	51.85	22.49	******	******	*****	.0065	.0695	.093	.986	.0074	14.3	.996	*****	.067	1
2	5.07	47.29	18.42	5.73	53.43	20.81	.0095	.0695	.137	.983	.0091	-4.6	.999	1.131	.080	2
3	.96	7.60	36.95	.25	1.97	9.58	.0257	.0695	.370	.958	.0232	-10.0	1.000	.259	.080	3
4	.69	6.00	26.98	.16	1.41	6.36	.0359	.0695	.517	.939	.0340	-5.2	1.004	.235	.080	4
5	.48	10.03	21.60	.11	2.39	5.14	.0424	.0695	.611	.931	.0391	-8.0	1.013	.235	.080	5
6	.22	10.20	18.69	.05	2.42	4.43	.0450	.0695	.647	.921	.0448	-.5	1.021	.232	.080	6
7	3.63	51.89	23.59	******	******	*****	.0065	.0695	.093	.986	.0074	13.8	.998	*****	.067	7
8	.74	5.17	29.06	.18	1.24	6.97	.0390	.0695	.561	.934	.0374	-4.0	1.057	.227	.080	8
9	.73	4.64	30.64	.17	1.11	7.34	.0340	.0695	.490	.940	.0337	-.9	1.041	.230	.080	9
10	.87	6.00	33.88	.22	1.52	8.58	.0297	.0695	.427	.948	.0292	-1.7	1.026	.247	.080	10
11	1.71	11.50	33.42	.50	3.37	9.78	.0216	.0695	.311	.959	.0227	5.3	1.014	.289	.080	11
12	2.90	26.61	23.64	5.31	48.76	43.33	.0118	.0695	.170	.978	.0119	.9	1.012	1.811	.080	12
13	9.30	56.53	21.02	******	******	*****	.0065	.0695	.093	.987	.0072	11.6	.995	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.229	GRAM/KW-HR	(.171	GRAM/BHP-HR)
BSCO ------- =	2.327	GRAM/KW-HR	(1.736	GRAM/BHP-HR)
BSNOX ------ =	7.062	GRAM/KW-HR	(5.268	GRAM/BHP-HR)
BSHC + BSNOX =	7.291	GRAM/KW-HR	(5.439	GRAM/BHP-HR)
CORR. BSFC - =	.250	KG/KW-HR	(.412	LBS/BHP-HR)

TABLE D-12B. ENGINE D13 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE:CATERPILLAR 3406 PCTA — NO. 2 FUEL — BAROMETER 29.15
TEST NO. D13-2 — FUEL: EM-408-F — PROJECT:11-5044-001 — DATE: 03/20/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 600.	0.	.0	.028	4.29	2.6	.837	58.	319.	1.54	120.	6.	69.	35.	1
2	2	INTER / 1260.	33.	4.3	.082	8.50	2.6	.843	88.	412.	2.02	126.	21.	198.	83.	2
3	25	INTER / 1260.	407.	53.7	.230	9.08	2.6	.870	52.	186.	5.44	625.	14.	95.	455.	3
4	50	INTER / 1260.	814.	107.4	.412	11.62	2.6	.889	56.	218.	8.14	675.	18.	134.	604.	4
5	75	INTER / 1260.	1221.	161.1	.622	15.03	2.6	.900	44.	412.	9.51	615.	19.	328.	718.	5
6	100	INTER / 1260.	1628.	214.8	.840	18.70	2.6	.907	20.	492.	9.98	595.	11.	504.	901.	6
7		IDLE / 600.	0.	.0	.028	4.28	2.6	.837	62.	439.	1.49	132.	7.	96.	39.	7
8	100	RATED / 2100.	1309.	287.8	1.149	29.65	2.6	.895	58.	173.	8.22	770.	52.	295.	1914.	8
9	75	RATED / 2100.	981.	215.7	.854	25.36	2.6	.885	54.	173.	7.30	735.	40.	247.	1514.	9
10	50	RATED / 2100.	654.	143.8	.607	20.49	2.6	.878	50.	181.	6.39	725.	30.	209.	1202.	10
11	25	RATED / 2100.	327.	71.9	.364	16.38	2.6	.864	72.	252.	4.89	565.	33.	228.	720.	11
12	2	RATED / 2100.	26.	5.7	.181	14.63	2.6	.847	74.	292.	2.60	219.	31.	244.	253.	12
13		IDLE / 600.	0.	.0	.028	4.28	2.6	.837	92.	439.	1.51	114.	10.	94.	33.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	"PHI"	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	3.73	41.16	21.16	******	******	*****	.0065	.0695	.094	.986	.0074	14.5	.995	*****	.067	1
2	4.33	40.52	17.04	4.94	46.20	19.43	.0096	.0695	.139	.982	.0097	1.2	1.001	1.140	.080	2
3	1.00	6.93	33.06	.26	1.78	8.48	.0253	.0695	.365	.954	.0254	.0	1.002	.256	.080	3
4	.73	5.43	24.40	.17	1.25	5.62	.0356	.0695	.512	.933	.0375	5.3	1.005	.229	.080	4
5	.50	8.78	19.24	.12	2.03	4.46	.0415	.0695	.597	.923	.0436	5.1	1.011	.229	.080	5
6	.22	9.99	17.87	.05	2.34	4.20	.0451	.0695	.648	.920	.0457	1.4	1.020	.230	.080	6
7	4.08	58.03	23.84	******	******	*****	.0065	.0695	.093	.986	.0073	12.7	.996	*****	.067	7
8	.75	4.27	27.77	.18	1.02	6.65	.0389	.0695	.559	.933	.0378	-2.7	1.057	.227	.080	8
9	.78	4.81	29.52	.19	1.14	7.02	.0338	.0695	.486	.940	.0337	-.2	1.038	.229	.080	9
10	.82	5.75	32.97	.21	1.46	8.36	.0297	.0695	.428	.947	.0296	-.3	1.024	.248	.080	10
11	1.53	10.42	32.96	.46	3.17	10.02	.0223	.0695	.321	.959	.0229	2.7	1.014	.300	.080	11
12	2.87	22.55	23.38	5.49	43.12	44.71	.0124	.0695	.178	.977	.0124	.1	1.009	1.895	.080	12
13	5.97	57.18	20.28	******	******	*****	.0065	.0695	.093	.986	.0074	14.3	.992	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.228	GRAM/KW-HR	(.170	GRAM/BHP-HR)
BSCO ------- =	2.132	GRAM/KW-HR	(1.590	GRAM/BHP-HR)
BSNOX ------ =	6.679	GRAM/KW-HR	(4.982	GRAM/BHP-HR)
BSHC + BSNOX =	6.907	GRAM/KW-HR	(5.152	GRAM/BHP-HR)
CORR. BSFC - =	.249	KG/KW-HR	(.410	LBS/BHP-HR)

TABLE D-13 A - ENGINE D14 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: CUMMINS NTC 350 BC
TEST NO. 014-1 FUEL: EM-408-F PROJECT: 11-5044-001
BAROMETER 28.88
DATE: 03/31/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 625.	0.	.0	.021	3.94	6.5	.920	244.	159.	1.18	105.	26.	34.	34.	1
2	2	INTER / 1400.	28.	4.2	.113	9.70	6.5	.924	152.	133.	1.52	156.	68.	119.	210.	2
3	25	INTER / 1400.	370.	54.3	.234	10.48	6.5	.932	100.	113.	4.96	495.	29.	65.	433.	3
4	50	INTER / 1400.	742.	108.8	.392	12.19	6.5	.939	89.	292.	7.61	960.	29.	183.	922.	4
5	75	INTER / 1400.	1112.	163.1	.626	14.32	6.5	.948	72.	800.	9.40	1314.	31.	645.	1638.	5
6	100	INTER / 1400.	1485.	217.7	.851	17.02	6.5	.953	96.	1739.	10.50	1590.	50.	1692.	2406.	6
7		IDLE / 625.	0.	.0	.021	3.97	6.5	.920	260.	146.	1.18	110.	28.	31.	35.	7
8	100	RATED / 2100.	1164.	255.9	.932	26.94	6.5	.941	100.	239.	7.52	1320.	79.	360.	3054.	8
9	75	RATED / 2100.	872.	191.8	.745	23.99	6.5	.939	76.	159.	6.46	945.	55.	223.	2030.	9
10	50	RATED / 2100.	582.	128.0	.534	20.93	6.5	.935	78.	146.	5.38	620.	48.	176.	1141.	10
11	25	RATED / 2100.	290.	63.8	.322	17.62	6.5	.929	104.	159.	3.99	340.	52.	156.	505.	11
12	2	RATED / 2100.	23.	5.1	.167	15.39	6.5	.924	216.	199.	2.13	150.	102.	187.	212.	12
13		IDLE / 625.	0.	.0	.022	3.97	6.5	.920	264.	226.	1.18	93.	29.	49.	30.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	"PHI"	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	20.23	26.52	26.29	******	******	*****	.0055	.0695	.078	.988	.0058	5.8	1.003	*****	.067	1
2	9.96	17.48	30.93	16.22	28.48	50.39	.0118	.0695	.169	.986	.0073	-37.9	1.008	1.616	.080	2
3	2.10	4.62	30.77	.54	1.20	7.97	.0225	.0695	.324	.957	.0232	2.9	1.010	.256	.080	3
4	1.24	7.77	39.18	.27	1.68	8.48	.0324	.0695	.466	.936	.0352	8.6	1.013	.214	.080	4
5	.82	17.17	45.63	.19	3.95	10.05	.0440	.0695	.633	.923	.0433	-1.6	1.019	.226	.080	5
6	.98	33.14	47.12	.23	7.77	11.05	.0503	.0695	.724	.914	.0486	-3.5	1.027	.228	.080	6
7	21.55	24.35	27.53	******	******	*****	.0054	.0695	.078	.988	.0058	6.7	1.006	*****	.067	7
8	1.41	6.44	54.64	.31	1.41	11.93	.0348	.0695	.501	.937	.0347	-.2	1.062	.206	.080	8
9	1.24	4.99	45.45	.29	1.16	10.59	.0312	.0695	.449	.945	.0300	-4.1	1.051	.222	.080	9
10	1.51	5.50	35.63	.38	1.38	8.92	.0257	.0695	.370	.954	.0251	-2.4	1.038	.241	.080	10
11	2.68	8.06	26.13	.81	2.44	7.91	.0184	.0695	.265	.965	.0188	2.0	1.027	.295	.080	11
12	10.15	18.65	21.20	20.05	36.87	41.89	.0109	.0695	.157	.980	.0102	-6.4	1.019	1.939	.080	12
13	21.74	37.43	23.12	******	******	*****	.0056	.0695	.080	.988	.0058	4.4	1.003	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.514	GRAM/KW-HR	(.383 GRAM/BHP-HR)
BSCO ------- =	3.271	GRAM/KW-HR	(2.440 GRAM/BHP-HR)
BSNOX ------ =	10.595	GRAM/KW-HR	(7.904 GRAM/BHP-HR)
BSHC + BSNOX =	11.109	GRAM/KW-HR	(8.287 GRAM/BHP-HR)
CORR. BSFC - =	.241	KG/KW-HR	(.397 LBS/BHP-HR)

TABLE D-13B. ENGINE D14 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: CUMMINS NTC 350 BIG CAM — NO. 2 FUEL — BAROMETER 28.86
TEST NO. D14-2 — FUEL: EM-408-F — PROJECT: 11-5044-001 — DATE: 04/02/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 625.	0.	.0	.023	3.85	13.0	1.065	248.	199.	1.27	87.	26.	42.	32.	1
2	2	INTER / 1400.	30.	4.4	.106	9.63	13.0	1.060	164.	186.	1.94	126.	54.	122.	143.	2
3	25	INTER / 1400.	370.	54.3	.234	10.48	13.0	1.050	100.	186.	5.11	440.	29.	104.	420.	3
4	50	INTER / 1400.	742.	108.8	.397	12.18	13.0	1.040	84.	385.	7.61	860.	28.	244.	924.	4
5	75	INTER / 1400.	1112.	163.1	.612	14.46	13.0	1.032	72.	949.	9.35	1185.	30.	750.	1578.	5
6	100	INTER / 1400.	1485.	217.7	.808	16.89	13.0	1.027	88.	2103.	10.44	1425.	44.	1948.	2212.	6
7		IDLE / 625.	0.	.0	.023	3.87	13.0	1.065	220.	239.	1.36	96.	22.	47.	33.	7
8	100	RATED / 2100.	1164.	255.9	.940	26.74	13.0	1.038	104.	239.	7.61	1135.	82.	359.	3015.	8
9	75	RATED / 2100.	872.	191.8	.745	24.16	13.0	1.042	79.	185.	6.59	895.	57.	254.	2092.	9
10	50	RATED / 2100.	582.	128.0	.543	20.80	13.0	1.046	85.	173.	5.49	565.	53.	208.	1159.	10
11	25	RATED / 2100.	290.	63.8	.340	17.75	13.0	1.053	104.	186.	4.02	308.	54.	191.	543.	11
12	2	RATED / 2100.	23.	5.1	.170	15.45	13.0	1.060	214.	212.	2.13	114.	103.	203.	189.	12
13		IDLE / 625.	0.	.0	.022	3.82	13.0	1.065	250.	252.	1.31	69.	25.	50.	24.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	19.13	30.81	23.40	******	******	*****	.0060	.0695	.086	.986	.0062	4.2	1.006	*****	.067	1
2	8.47	19.17	22.47	12.29	27.82	32.60	.0111	.0695	.160	.981	.0093	-16.4	1.012	1.435	.080	2
3	2.04	7.37	29.86	.53	1.91	7.73	.0226	.0695	.326	.954	.0239	5.4	1.012	.256	.080	3
4	1.17	10.24	38.82	.26	2.24	8.50	.0330	.0695	.475	.935	.0352	6.7	1.017	.215	.080	4
5	.83	20.44	42.97	.19	4.60	9.67	.0429	.0695	.617	.922	.0432	.7	1.023	.220	.080	5
6	.90	40.17	45.61	.20	8.95	10.16	.0485	.0695	.698	.913	.0485	.0	1.031	.216	.080	6
7	15.89	34.60	24.15	******	******	*****	.0059	.0695	.086	.985	.0066	11.7	1.007	*****	.067	7
8	1.46	6.36	53.46	.32	1.40	11.78	.0356	.0695	.513	.935	.0352	-1.3	1.066	.207	.080	8
9	1.27	5.69	46.82	.29	1.33	10.91	.0312	.0695	.449	.943	.0306	-2.1	1.054	.221	.080	9
10	1.62	6.39	35.60	.41	1.63	9.06	.0264	.0695	.380	.952	.0256	-3.2	1.042	.244	.080	10
11	2.67	9.35	26.60	.85	2.99	8.50	.0194	.0695	.279	.963	.0189	-2.6	1.031	.310	.080	11
12	10.06	19.86	18.48	20.25	39.97	37.18	.0112	.0695	.160	.979	.0102	-8.3	1.023	1.967	.080	12
13	18.65	37.71	17.94	******	******	*****	.0058	.0695	.084	.985	.0064	10.6	1.003	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.498	GRAM/KW-HR	(.371 GRAM/BHP-HR)
BSCO ------- =	3.771	GRAM/KW-HR	(2.813 GRAM/BHP-HR)
BSNOX ------ =	10.352	GRAM/KW-HR	(7.722 GRAM/BHP-HR)
BSHC + BSNOX =	10.849	GRAM/KW-HR	(8.094 GRAM/BHP-HR)
CORR. BSFC - =	.239	KG/KW-HR	(.394 LBS/BHP-HR)

TABLE D-14A. ENGINE D15 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: INTERNATIONAL DT 466 — NO. 2 FUEL — BAROMETER 29.21
TEST NO. D15-1 — FUEL: EM-408-F — PROJECT: 11-5044-001 — DATE: 04/14/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 738.	0.	.0	.012	2.81	3.5	.864	232.	292.	1.27	219.	13.	33.	34.	1
2	2	INTER / 1800.	12.	2.3	.064	7.07	3.5	.870	332.	359.	1.76	123.	71.	154.	75.	2
3	25	INTER / 1800.	157.	29.7	.137	7.34	3.5	.882	262.	372.	3.92	310.	56.	156.	187.	3
4	50	INTER / 1800.	315.	59.3	.226	8.18	3.5	.894	186.	247.	6.01	535.	44.	113.	356.	4
5	75	INTER / 1800.	472.	89.0	.331	9.52	3.5	.903	128.	353.	7.71	790.	35.	184.	607.	5
6	100	INTER / 1800.	629.	118.6	.454	11.12	3.5	.911	88.	990.	9.17	955.	28.	592.	849.	6
7		IDLE / 738.	0.	.0	.014	2.77	3.5	.865	240.	337.	1.14	207.	17.	49.	43.	7
8	100	RATED / 2600.	570.	155.1	.640	17.31	3.9	.909	88.	228.	8.30	930.	44.	214.	1295.	8
9	75	RATED / 2600.	427.	116.3	.474	15.26	3.9	.902	110.	182.	7.12	760.	47.	147.	906.	9
10	50	RATED / 2600.	285.	77.6	.352	13.27	3.9	.895	152.	183.	5.82	555.	58.	134.	595.	10
11	25	RATED / 2600.	142.	38.8	.226	11.62	3.9	.886	216.	252.	4.16	315.	72.	166.	300.	11
12	2	RATED / 2600.	11.	3.0	.120	10.37	3.9	.876	320.	329.	1.78	129.	127.	262.	147.	12
13		IDLE / 738.	0.	.0	.014	2.77	3.9	.868	284.	300.	1.12	177.	21.	45.	37.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	17.76	44.95	47.54	******	******	*****	.0043	.0695	.062	.988	.0062	44.6	.995	*****	.067	1
2	18.44	39.95	19.43	30.93	67.00	32.59	.0091	.0695	.131	.984	.0086	-5.5	.993	1.689	.080	2
3	6.81	19.01	22.80	1.88	5.26	6.31	.0187	.0695	.269	.966	.0186	-.5	.994	.278	.080	3
4	3.24	8.31	26.24	.74	1.90	6.01	.0278	.0695	.400	.950	.0280	.9	.997	.230	.080	4
5	1.76	9.26	30.55	.39	2.07	6.82	.0349	.0695	.502	.936	.0357	2.2	1.001	.223	.080	5
6	1.03	21.72	31.16	.24	4.99	7.16	.0410	.0695	.590	.925	.0424	3.5	1.018	.226	.080	6
7	20.26	57.27	49.67	******	******	*****	.0052	.0695	.075	.989	.0057	8.7	.991	*****	.067	7
8	1.13	5.57	33.73	.28	1.38	8.35	.0371	.0695	.534	.932	.0382	3.0	1.050	.236	.080	8
9	1.64	5.18	31.84	.40	1.27	7.79	.0312	.0695	.449	.941	.0329	5.6	1.039	.235	.080	9
10	2.73	6.36	28.20	.74	1.73	7.67	.0266	.0695	.383	.951	.0271	1.9	1.026	.265	.080	10
11	5.33	12.19	22.05	1.87	4.27	7.72	.0196	.0695	.282	.964	.0196	.3	1.015	.345	.080	11
12	17.63	36.30	20.35	43.02	88.59	49.67	.0116	.0695	.167	.984	.0087	-25.2	1.010	2.418	.080	12
13	24.36	51.82	43.32	******	******	*****	.0052	.0695	.075	.989	.0056	6.9	.994	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.905	GRAM/KW-HR	(.675	GRAM/BHP-HR)
BSCO ------- =	3.231	GRAM/KW-HR	(2.410	GRAM/BHP-HR)
BSNOX ------ =	7.848	GRAM/KW-HR	(5.855	GRAM/BHP-HR)
BSHC + BSNOX =	8.753	GRAM/KW-HR	(6.530	GRAM/BHP-HR)
CORR. BSFC - =	.260	KG/KW-HR	(.427	LBS/BHP-HR)

TABLE D-14B. ENGINE D15 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: INTERNATIONAL DT 466 NO. 2 FUEL BAROMETER 29.23
TEST NO. D15-2 FUEL: EM-408-F PROJECT: 11-5044-001 DATE: 04/15/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 740.	0.	.0	.016	2.87	3.9	.852	240.	300.	1.34	222.	17.	42.	43.	1
2	2	INTER / 1800.	12.	2.3	.063	7.21	3.9	.857	320.	351.	1.81	126.	66.	144.	72.	2
3	25	INTER / 1800.	157.	29.7	.139	7.42	3.9	.873	258.	340.	4.15	340.	53.	137.	195.	3
4	50	INTER / 1800.	315.	59.3	.236	8.37	3.9	.890	196.	239.	5.49	545.	53.	124.	412.	4
5	75	INTER / 1800.	472.	89.0	.345	9.77	3.9	.903	160.	425.	7.03	790.	50.	253.	693.	5
6	100	INTER / 1800.	629.	118.6	.461	11.00	3.9	.915	90.	1030.	9.25	930.	29.	619.	835.	6
7		IDLE / 740.	0.	.0	.015	2.86	3.9	.851	228.	313.	1.29	216.	16.	43.	41.	7
8	100	RATED / 2600.	570.	155.1	.640	17.12	4.1	.910	84.	266.	8.14	935.	42.	254.	1328.	8
9	75	RATED / 2600.	427.	116.3	.492	15.20	4.1	.902	112.	186.	7.16	790.	49.	155.	972.	9
10	50	RATED / 2600.	285.	77.6	.357	13.27	4.1	.893	152.	188.	5.85	505.	58.	139.	546.	10
11	25	RATED / 2600.	142.	38.8	.231	11.73	4.1	.881	212.	274.	4.24	330.	71.	180.	312.	11
12	2	RATED / 2600.	11.	3.0	.126	10.55	4.1	.869	318.	353.	2.44	144.	98.	216.	125.	12
13		IDLE / 740.	0.	.0	.015	2.86	4.1	.859	278.	319.	1.31	231.	19.	43.	44.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	17.44	43.81	45.05	******	******	*****	.0056	.0695	.080	.987	.0066	18.6	.998	*****	.067	1
2	17.33	38.06	19.10	28.52	62.64	31.44	.0088	.0695	.126	.983	.0089	.8	1.003	1.640	.080	2
3	6.36	16.44	23.43	1.79	4.62	6.59	.0188	.0695	.270	.964	.0196	4.6	1.003	.280	.080	3
4	3.71	8.79	29.11	.89	2.10	6.95	.0283	.0695	.407	.954	.0257	-9.2	1.009	.236	.080	4
5	2.40	12.21	33.42	.56	2.84	7.78	.0355	.0695	.511	.942	.0327	-8.0	1.015	.230	.080	5
6	1.04	22.40	30.18	.24	5.22	7.04	.0421	.0695	.606	.924	.0428	1.6	1.021	.228	.080	6
7	17.17	47.40	45.44	******	******	*****	.0053	.0695	.076	.988	.0064	19.7	1.003	*****	.067	7
8	1.10	6.62	34.58	.27	1.64	8.56	.0376	.0695	.540	.933	.0375	-.1	1.059	.234	.080	8
9	1.66	5.27	32.91	.42	1.34	8.35	.0325	.0695	.468	.941	.0331	1.9	1.045	.243	.080	9
10	2.72	6.50	25.45	.75	1.80	7.04	.0270	.0695	.389	.951	.0273	.8	1.032	.268	.080	10
11	5.13	13.01	22.52	1.83	4.64	8.03	.0197	.0695	.284	.963	.0200	1.4	1.022	.349	.080	11
12	12.97	28.66	16.58	33.14	73.25	42.37	.0120	.0695	.172	.978	.0118	-1.6	1.016	2.515	.080	12
13	20.55	47.41	48.12	******	******	*****	.0053	.0695	.076	.987	.0065	22.0	1.003	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.885	GRAM/KW-HR	(.660	GRAM/BHP-HR)
BSCO ------- =	3.380	GRAM/KW-HR	(2.521	GRAM/BHP-HR)
BSNOX ------ =	8.115	GRAM/KW-HR	(6.054	GRAM/BHP-HR)
BSHC + BSNOX =	9.001	GRAM/KW-HR	(6.715	GRAM/BHP-HR)
CORR. BSFC - =	.264	KG/KW-HR	(.434	LBS/BHP-HR)

TABLE D-15A. ENGINE D16 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE:DETROIT 6V92 TA — NO. 2 FUEL — BAROMETER 28.89
TEST NO. D16-1 — FUEL: EM-408-F — PROJECT:11-5044-001 — DATE: 04/24/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 497.	0.	.0	.017	4.35	12.3	1.086	180.	141.	1.16	209.	15.	24.	62.	1
2	2	INTER / 1300.	24.	3.3	.084	13.49	12.3	1.082	156.	130.	1.38	93.	57.	95.	120.	2
3	25	INTER / 1300.	311.	42.3	.201	14.59	12.3	1.070	139.	122.	3.03	320.	56.	98.	448.	3
4	50	INTER / 1300.	621.	84.6	.325	16.26	12.3	1.060	143.	133.	4.60	600.	63.	114.	891.	4
5	75	INTER / 1300.	932.	126.9	.476	18.51	12.3	1.050	147.	319.	5.80	970.	76.	317.	1655.	5
6	100	INTER / 1300.	1242.	169.1	.644	21.10	12.3	1.043	124.	1682.	6.96	1110.	76.	1992.	2237.	6
7		IDLE / 497.	0.	.0	.019	4.39	12.3	1.085	176.	159.	1.14	209.	18.	32.	73.	7
8	100	RATED / 2100.	1099.	241.6	.930	32.77	12.1	1.039	133.	199.	5.97	890.	130.	367.	2856.	8
9	75	RATED / 2100.	823.	181.1	.720	30.18	12.1	1.045	134.	127.	5.09	640.	120.	221.	1896.	9
10	50	RATED / 2100.	549.	120.8	.522	27.76	12.1	1.052	137.	130.	4.06	395.	109.	203.	1057.	10
11	25	RATED / 2100.	274.	60.3	.348	25.10	12.1	1.059	155.	133.	2.94	220.	112.	190.	599.	11
12	2	RATED / 2100.	22.	4.8	.182	22.82	12.1	1.068	188.	196.	1.62	90.	126.	197.	211.	12
13		IDLE / 497.	0.	.0	.018	4.47	12.1	1.073	170.	157.	1.05	186.	17.	32.	67.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	NET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	15.32	24.08	61.75	******	******	*****	.0039	.0695	.056	.986	.0056	45.0	.999	*****	.067	1
2	11.24	18.79	23.74	17.10	28.58	36.11	.0063	.0695	.091	.985	.0067	5.2	1.005	1.519	.080	2
3	4.68	8.13	37.21	1.33	2.31	10.60	.0139	.0695	.201	.971	.0143	2.8	1.005	.283	.080	3
4	3.22	5.85	45.64	.74	1.35	10.54	.0203	.0695	.292	.959	.0216	6.4	1.009	.229	.080	4
5	2.65	11.11	57.89	.60	2.50	13.05	.0261	.0695	.375	.949	.0271	4.0	1.014	.222	.080	5
6	1.98	51.56	57.91	.45	11.78	13.23	.0309	.0695	.445	.943	.0307	-.6	1.019	.229	.080	6
7	15.20	27.58	62.68	******	******	*****	.0045	.0695	.064	.987	.0055	24.0	.999	*****	.067	7
8	2.34	6.58	51.19	.54	1.52	11.82	.0287	.0695	.413	.948	.0278	-3.2	1.043	.221	.080	8
9	2.77	5.10	43.87	.66	1.22	10.47	.0242	.0695	.348	.955	.0235	-2.5	1.038	.230	.080	9
10	3.48	6.48	33.79	.90	1.68	8.75	.0190	.0695	.274	.963	.0191	.3	1.030	.251	.080	10
11	5.37	9.12	26.07	1.86	3.16	9.03	.0190	.0695	.202	.972	.0139	-.7	1.025	.338	.080	11
12	11.56	17.97	19.30	26.49	41.18	44.22	.0081	.0695	.116	.983	.0078	-3.5	1.022	2.242	.080	12
13	15.90	29.52	61.23	******	******	*****	.0041	.0695	.059	.987	.0051	24.6	.997	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.936	GRAM/KW-HR	(.698	GRAM/BHP-HR)
BSCO ------- =	3.738	GRAM/KW-HR	(2.789	GRAM/BHP-HR)
BSNOX ------ =	11.680	GRAM/KW-HR	(8.713	GRAM/BHP-HR)
BSHC + BSNOX =	12.615	GRAM/KW-HR	(9.411	GRAM/BHP-HR)
CORR. BSFC - =	.253	KG/KW-HR	(.416	LBS/BHP-HR)

RECORD NO. 17 ENGINE:DET

.!.....1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

* ERROR DATA INPUT * ILLEGAL DATA IN FIELD *1*
ERROR NUMBER 78 DETECTED BY INCOM= AT ADDRESS 000210
CALLED FROM KRAKER= AT ADDRESS 000345
CALLED FROM INPC= AT ADDRESS 000075

TABLE D-15B. ENGINE D16 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DETROIT 6V92 TA — NO. 2 FUEL — BAROMETER 28.82
TEST NO. D16-2 — FUEL: EM-408-F — PROJECT: 11-5044-001 — DATE: 09/29/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 497.	0.	.0	.023	9.49	12.2	1.058	172.	159.	1.13	201.	20.	38.	83.	1
2	2	INTER / 1300.	24.	3.3	.088	13.32	12.2	1.056	131.	133.	1.45	111.	48.	97.	140.	2
3	25	INTER / 1300.	311.	42.3	.207	14.37	12.2	1.048	129.	111.	3.06	310.	54.	91.	436.	3
4	50	INTER / 1300.	621.	84.6	.349	16.01	12.2	1.041	132.	135.	4.60	620.	62.	129.	971.	4
5	75	INTER / 1300.	932.	126.9	.494	18.24	12.2	1.036	133.	361.	5.92	970.	70.	365.	1656.	5
6	100	INTER / 1300.	1242.	169.1	.637	20.97	11.9	1.026	112.	1767.	6.51	1134.	68.	2059.	2208.	6
7		IDLE / 497.	0.	.0	.022	9.40	11.9	1.046	168.	162.	1.27	216.	17.	34.	77.	7
8	100	RATED / 2100.	1099.	241.6	.932	32.18	11.9	1.027	126.	218.	5.97	890.	124.	919.	2830.	8
9	75	RATED / 2100.	823.	181.1	.729	29.67	11.9	1.031	121.	162.	4.99	650.	110.	288.	1941.	9
10	50	RATED / 2100.	549.	120.8	.525	27.19	11.9	1.035	133.	157.	4.03	410.	107.	248.	1095.	10
11	25	RATED / 2100.	274.	60.3	.351	24.82	12.2	1.049	128.	159.	2.86	228.	96.	236.	579.	11
12	2	RATED / 2100.	22.	4.8	.177	22.57	12.2	1.055	180.	157.	1.59	95.	119.	209.	217.	12
13		IDLE / 497.	0.	.0	.022	9.41	12.2	1.058	188.	188.	1.08	201.	23.	96.	85.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	14.98	27.83	60.73	******	******	*****	.0051	.0695	.074	.987	.0055	7.3	1.005	*****	.067	1
2	9.01	18.34	26.38	14.36	29.23	42.05	.0067	.0695	.097	.985	.0070	3.9	1.014	1.572	.080	2
3	4.31	7.33	35.01	1.27	2.16	10.30	.0196	.0695	.210	.971	.0195	-1.1	1.013	.290	.080	3
4	2.98	5.94	46.34	.74	1.47	11.48	.0221	.0695	.318	.959	.0215	-2.4	1.017	.244	.080	4
5	2.35	12.31	55.92	.55	2.87	13.05	.0274	.0695	.394	.948	.0276	.9	1.022	.228	.080	5
6	1.77	53.71	57.73	.40	12.15	13.05	.0308	.0695	.443	.943	.0310	.6	1.029	.220	.080	6
7	13.08	25.31	57.60	******	******	*****	.0051	.0695	.074	.986	.0062	19.9	1.008	*****	.067	7
8	2.21	7.39	50.59	.51	1.71	11.71	.0293	.0695	.422	.948	.0278	-5.2	1.055	.219	.080	8
9	2.52	6.57	44.35	.61	1.59	10.72	.0249	.0695	.358	.956	.0233	-6.2	1.046	.231	.080	9
10	3.40	7.87	34.73	.89	2.05	9.06	.0195	.0695	.281	.963	.0189	-3.1	1.043	.250	.080	10
11	4.55	11.21	27.50	1.59	3.91	9.61	.0143	.0695	.206	.973	.0136	-5.3	1.034	.338	.080	11
12	11.27	19.68	20.51	25.02	43.69	45.52	.0079	.0695	.114	.984	.0077	-3.2	1.029	2.158	.080	12
13	17.03	34.24	63.21	******	******	*****	.0051	.0695	.074	.988	.0053	3.3	1.003	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.878	GRAM/KW-HR	(.655 GRAM/BHP-HR)
BSCO ------- =	4.082	GRAM/KW-HR	(3.045 GRAM/BHP-HR)
BSNOX ------ =	11.865	GRAM/KW-HR	(8.852 GRAM/BHP-HR)
BSHC + BSNOX =	12.744	GRAM/KW-HR	(9.507 GRAM/BHP-HR)
CORR. BSFC - =	.254	KG/KW-HR	(.418 LBS/BHP-HR)

TABLE D-16A. ENGINE D17 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DETROIT 8V71TA — NO. 2 FUEL — BAROMETER 29.03
TEST NO. D17-1 — FUEL: EM-408-F — PROJECT: 11-5044-001 — DATE: 05/08/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 490.	0.	.0	.028	4.31	12.0	1.068	180.	159.	1.54	246.	20.	35.	93.	1
2	2	INTER / 1260.	27.	3.6	.088	12.70	12.0	1.067	180.	244.	1.60	120.	59.	160.	137.	2
3	25	INTER / 1260.	342.	45.1	.211	13.89	12.0	1.056	142.	141.	3.54	320.	52.	102.	398.	3
4	50	INTER / 1260.	685.	90.4	.365	16.06	12.0	1.046	141.	165.	5.22	620.	62.	140.	897.	4
5	75	INTER / 1260.	1020.	134.6	.533	19.18	12.0	1.039	119.	666.	6.29	955.	63.	681.	1656.	5
6	100	INTER / 1260.	1370.	180.8	.714	22.92	12.0	1.034	96.	1868.	6.77	1020.	63.	2340.	2156.	6
7		IDLE / 490.	0.	.0	.028	4.30	12.0	1.068	192.	191.	1.45	243.	22.	44.	97.	7
8	100	RATED / 2100.	1173.	258.0	1.020	34.27	12.0	1.036	123.	146.	6.46	860.	123.	280.	2293.	8
9	75	RATED / 2100.	879.	193.3	.819	31.55	12.0	1.041	128.	125.	5.49	650.	120.	227.	2002.	9
10	50	RATED / 2100.	586.	128.9	.611	28.50	12.0	1.047	135.	132.	4.46	410.	115.	220.	1166.	10
11	25	RATED / 2100.	293.	64.4	.397	25.25	12.0	1.055	144.	130.	3.28	228.	107.	191.	575.	11
12	2	RATED / 2100.	23.	5.1	.196	22.47	12.0	1.065	179.	159.	1.98	100.	107.	189.	207.	12
13		IDLE / 490.	0.	.0	.028	4.27	12.0	1.068	208.	180.	1.45	234.	24.	41.	94.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	11.63	20.56	55.44	******	******	*****	.0066	.0695	.094	.984	.0074	13.2	.992	*****	.067	1
2	11.15	30.24	25.90	16.47	44.68	38.26	.0070	.0695	.101	.983	.0077	10.4	.999	1.478	.080	2
3	4.11	8.04	31.45	1.15	2.26	8.82	.0154	.0695	.221	.967	.0167	8.6	1.000	.281	.080	3
4	2.82	6.40	41.01	.68	1.55	9.93	.0230	.0695	.331	.954	.0244	6.1	1.004	.241	.080	4
5	1.98	21.29	51.75	.47	5.06	12.30	.0281	.0695	.405	.945	.0295	4.7	1.010	.235	.080	5
6	1.46	54.59	50.31	.35	12.94	11.93	.0315	.0695	.454	.941	.0322	2.0	1.017	.233	.080	6
7	13.10	26.12	57.91	******	******	*****	.0066	.0695	.095	.984	.0070	6.8	.993	*****	.067	7
8	2.01	4.58	45.64	.48	1.09	10.83	.0301	.0695	.433	.944	.0300	-.5	1.041	.228	.080	8
9	2.44	4.61	40.77	.62	1.17	10.36	.0263	.0695	.378	.952	.0256	-2.5	1.038	.245	.080	9
10	3.13	5.99	31.79	.89	1.70	9.05	.0217	.0695	.312	.960	.0209	-3.7	1.030	.276	.080	10
11	4.49	8.00	24.16	1.66	2.96	8.93	.0159	.0695	.229	.970	.0155	-2.6	1.023	.361	.080	11
12	9.07	16.07	17.56	21.05	37.30	40.76	.0088	.0695	.127	.980	.0095	7.4	1.019	2.278	.080	12
13	14.19	24.61	55.74	******	******	*****	.0066	.0695	.095	.985	.0070	6.1	.996	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.837	GRAM/KW-HR	(.625	GRAM/BHP-HR)
BSCO ------- =	4.193	GRAM/KW-HR	(3.128	GRAM/BHP-HR)
BSNOX ------ =	11.073	GRAM/KW-HR	(8.260	GRAM/BHP-HR)
BSHC + BSNOX =	11.910	GRAM/KW-HR	(8.885	GRAM/BHP-HR)
CORR. BSFC - =	.266	KG/KW-HR	(.438	LBS/BHP-HR)

TABLE D-16B. ENGINE D17 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: DETROIT 8V71TA
TEST NO. D17-2 FUEL: EM-408-F PROJECT: 111-5044-001
BAROMETER 29.03
DATE: 05/08/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 490.	0.	.0	.029	4.20	10.6	1.001	184.	159.	1.33	231.	24.	41.	97.	1
2	2	INTER / 1260.	27.	3.6	.084	12.62	10.6	1.001	202.	258.	1.57	123.	64.	164.	127.	2
3	25	INTER / 1260.	342.	45.1	.212	13.87	10.6	1.000	154.	167.	3.54	335.	57.	121.	397.	3
4	50	INTER / 1260.	685.	90.4	.359	15.95	10.6	1.000	148.	207.	5.22	690.	64.	173.	939.	4
5	75	INTER / 1260.	1027.	135.5	.537	19.03	10.6	.999	120.	693.	6.24	990.	65.	719.	1674.	5
6	100	INTER / 1260.	1370.	180.8	.707	22.93	10.6	.999	88.	1868.	6.72	1059.	57.	2332.	2155.	6
7		IDLE / 490.	0.	.0	.024	4.24	10.6	1.001	160.	212.	1.25	225.	18.	49.	84.	7
8	100	RATED / 2100.	1193.	258.0	1.018	34.34	10.6	.999	118.	125.	6.46	915.	118.	240.	2860.	8
9	75	RATED / 2100.	899.	193.3	.797	31.45	10.6	.999	130.	101.	5.41	655.	120.	181.	1915.	9
10	50	RATED / 2100.	586.	128.9	.572	28.42	10.6	1.000	135.	106.	4.19	410.	114.	176.	1109.	10
11	25	RATED / 2100.	293.	64.4	.378	25.23	10.6	1.000	154.	106.	3.12	230.	114.	156.	551.	11
12	2	RATED / 2100.	23.	5.1	.196	22.47	10.6	1.000	196.	125.	1.80	99.	128.	163.	211.	12
13		IDLE / 490.	0.	.0	.028	4.24	10.6	1.001	192.	154.	1.10	174.	29.	47.	87.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	13.67	23.72	56.27	******	******	*****	.0069	.0695	.100	.986	.0064	-7.0	.997	*****	.067	1
2	12.71	32.50	25.30	17.87	45.70	35.58	.0067	.0695	.097	.984	.0076	13.5	1.003	1.402	.080	2
3	4.46	9.52	31.15	1.26	2.69	8.80	.0155	.0695	.223	.967	.0167	8.0	1.005	.281	.080	3
4	2.95	8.02	43.59	.70	1.91	10.39	.0228	.0695	.327	.954	.0244	7.3	1.008	.236	.080	4
5	2.01	22.32	51.98	.48	5.30	12.35	.0285	.0695	.410	.946	.0292	2.6	1.013	.235	.080	5
6	1.35	54.99	50.82	.32	12.90	11.92	.0311	.0695	.448	.941	.0319	2.5	1.020	.230	.080	6
7	12.60	33.53	58.10	******	******	*****	.0058	.0695	.083	.987	.0061	5.6	.999	*****	.067	7
8	1.93	3.92	46.83	.46	.93	11.08	.0300	.0695	.431	.944	.0300	.0	1.043	.227	.080	8
9	2.51	3.78	40.02	.62	.94	9.91	.0256	.0695	.369	.953	.0252	-1.6	1.036	.239	.080	9
10	3.33	5.12	32.31	.89	1.36	8.61	.0203	.0695	.293	.963	.0197	-3.4	1.029	.259	.080	10
11	5.04	6.86	24.29	1.77	2.41	8.55	.0151	.0695	.218	.971	.0147	-2.6	1.022	.344	.080	11
12	10.89	13.89	17.96	25.24	32.18	41.61	.0088	.0695	.127	.982	.0086	-1.9	1.017	2.279	.080	12
13	17.12	27.63	50.97	******	******	*****	.0067	.0695	.097	.989	.0054	-20.5	.995	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.869	GRAM/KW-HR	(.648	GRAM/BHP-HR)
BSCO ------- =	4.107	GRAM/KW-HR	(3.064	GRAM/BHP-HR)
BSNOX ------ =	11.007	GRAM/KW-HR	(8.211	GRAM/BHP-HR)
BSHC + BSNOX =	11.876	GRAM/KW-HR	(8.859	GRAM/BHP-HR)
CORR. BSFC - =	.261	KG/KW-HR	(.429	LBS/BHP-HR)

TABLE D-17A. ENGINE D18 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE:CUMMINS NTC 290 NO. 2 FUEL BAROMETER 29.02
TEST NO.D18-1 FUEL: EM-408-F PROJECT:11-5044-001 DATE: 05/26/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 500.	0.	.0	.020	3.18	15.4	1.136	372.	319.	1.36	105.	32.	56.	34.	1
2	2	INTER / 1300.	26.	3.5	.079	8.17	15.4	1.130	174.	279.	2.00	150.	41.	132.	131.	2
3	25	INTER / 1300.	316.	43.0	.189	9.41	15.4	1.109	88.	210.	4.73	399.	22.	102.	350.	3
4	50	INTER / 1300.	633.	86.2	.336	11.04	15.4	1.089	76.	279.	7.03	830.	23.	162.	858.	4
5	75	INTER / 1300.	949.	129.3	.484	12.33	15.4	1.073	76.	639.	8.82	1380.	27.	425.	1606.	5
6	100	INTER / 1300.	1267.	172.5	.658	14.48	15.4	1.062	75.	1739.	10.39	1860.	31.	1321.	2448.	6
7		IDLE / 500.	0.	.0	.020	3.09	15.4	1.136	360.	319.	1.38	120.	31.	55.	38.	7
8	100	RATED / 1900.	1066.	212.1	.800	22.25	15.4	1.079	80.	292.	7.99	1620.	51.	356.	3474.	8
9	75	RATED / 1900.	800.	159.2	.623	19.67	15.2	1.080	67.	212.	6.98	1155.	38.	230.	2210.	9
10	50	RATED / 1900.	533.	106.1	.441	16.76	15.2	1.089	75.	186.	5.82	705.	36.	171.	1154.	10
11	25	RATED / 1900.	267.	53.2	.277	14.43	15.2	1.101	89.	199.	4.33	387.	35.	154.	540.	11
12	2	RATED / 1900.	20.	4.0	.147	12.16	15.2	1.113	174.	306.	2.44	195.	63.	221.	256.	12
13		IDLE / 500.	0.	.0	.020	3.16	15.2	1.123	380.	319.	1.31	101.	34.	58.	33.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	26.44	45.43	27.72	******	******	*****	.0065	.0695	.094	.984	.0068	3.7	1.010	*****	.067	1
2	8.69	27.77	27.52	11.79	37.69	37.35	.0099	.0695	.142	.979	.0096	-2.3	1.011	1.342	.080	2
3	1.93	8.98	30.88	.51	2.37	8.14	.0204	.0695	.293	.957	.0222	8.6	1.011	.261	.080	3
4	1.15	8.04	42.50	.27	1.88	9.95	.0309	.0695	.445	.939	.0326	5.3	1.018	.230	.080	4
5	.92	14.63	55.32	.21	3.29	12.42	.0398	.0695	.573	.925	.0407	2.1	1.023	.220	.080	5
6	.78	33.49	62.06	.18	7.66	14.20	.0461	.0695	.664	.913	.0481	4.3	1.034	.221	.080	6
7	25.25	44.84	31.26	******	******	*****	.0067	.0695	.097	.984	.0068	1.9	1.013	*****	.067	7
8	1.07	7.41	72.33	.24	1.68	16.38	.0365	.0695	.526	.931	.0369	.9	1.070	.212	.080	8
9	1.02	6.16	59.15	.24	1.45	13.88	.0322	.0695	.463	.939	.0323	.5	1.056	.222	.080	9
10	1.35	6.48	43.63	.34	1.61	10.88	.0267	.0695	.384	.948	.0271	1.5	1.041	.239	.080	10
11	2.13	9.29	32.47	.66	2.91	10.15	.0195	.0695	.281	.960	.0203	4.2	1.032	.303	.080	11
12	7.17	25.04	28.98	15.66	54.69	63.30	.0123	.0695	.177	.976	.0117	-4.9	1.022	2.137	.080	12
13	27.95	47.05	27.29	******	******	*****	.0066	.0695	.094	.985	.0065	-.5	1.005	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.464	GRAM/KW-HR	(.346 GRAM/BHP-HR)
BSCO ------- =	3.525	GRAM/KW-HR	(2.630 GRAM/BHP-HR)
BSNOX ------ =	13.533	GRAM/KW-HR	(10.096 GRAM/BHP-HR)
BSHC + BSNOX =	13.997	GRAM/KW-HR	(10.442 GRAM/BHP-HR)
CORR. BSFC - =	.243	KG/KW-HR	(.399 LBS/BHP-HR)

TABLE D-17B. ENGINE D18 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: CUMMINS NTC 290 — NO. 2 FUEL — BAROMETER 29.01
TEST NO. D18-2 — FUEL: EM-408-F — PROJECT: 11-5044-001 — DATE: 05/26/80

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 500.	0.	.0	.020	3.11	15.4	1.136	332.	266.	1.49	122.	26.	42.	36.	1
2	2	INTER / 1300.	26.	3.5	.079	8.13	15.4	1.130	164.	239.	1.97	168.	40.	115.	149.	2
3	25	INTER / 1300.	316.	43.0	.181	9.31	15.4	1.110	85.	170.	4.60	430.	21.	81.	373.	3
4	50	INTER / 1300.	633.	86.2	.321	10.81	15.4	1.091	72.	239.	6.89	880.	21.	136.	888.	4
5	75	INTER / 1300.	949.	129.3	.503	12.40	15.4	1.071	67.	626.	8.82	1455.	25.	432.	1756.	5
6	100	INTER / 1300.	1869.	172.8	.661	14.14	15.4	1.059	64.	1839.	10.32	1920.	26.	1414.	2551.	6
7		IDLE / 500.	0.	.0	.020	3.07	15.4	1.136	320.	279.	1.43	135.	27.	47.	42.	7
8	100	RATED / 1900.	1066.	212.1	.797	22.32	15.7	1.085	86.	292.	7.90	1680.	56.	358.	3650.	8
9	95	RATED / 1900.	800.	159.2	.620	19.75	15.7	1.094	68.	209.	6.93	1221.	34.	227.	2372.	9
10	50	RATED / 1900.	533.	106.1	.441	16.93	15.7	1.106	76.	199.	5.80	750.	36.	184.	1250.	10
11	25	RATED / 1900.	267.	53.2	.272	14.37	15.7	1.122	86.	266.	4.26	400.	34.	206.	567.	11
12	2	RATED / 1900.	20.	4.0	.149	12.20	15.7	1.137	160.	425.	2.56	231.	56.	295.	298.	12
13		IDLE / 500.	0.	.0	.020	3.15	15.7	1.150	368.	479.	1.31	108.	33.	85.	36.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	'PHI'	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	21.79	34.93	29.71	******	******	*****	.0065	.0695	.094	.983	.0073	11.8	1.010	*****	.067	1
2	8.33	24.20	31.36	11.30	32.85	42.56	.0099	.0695	.143	.980	.0095	-4.4	1.015	1.337	.080	2
3	1.92	7.48	34.29	.49	1.89	8.67	.0198	.0695	.285	.958	.0215	8.9	1.017	.249	.080	3
4	1.11	7.03	46.07	.85	1.57	10.30	.0302	.0695	.434	.940	.0319	5.8	1.022	.219	.080	4
5	.81	14.34	58.21	.19	3.35	13.58	.0411	.0695	.592	.925	.0407	-1.1	1.029	.227	.080	5
6	.67	35.62	64.29	.16	8.18	14.76	.0475	.0695	.684	.913	.0478	.7	1.039	.222	.080	6
7	21.83	38.11	34.18	******	******	*****	.0068	.0695	.097	.984	.0070	4.1	1.017	*****	.067	7
8	1.16	7.49	76.29	.26	1.69	17.21	.0363	.0695	.522	.932	.0368	.5	1.071	.211	.080	8
9	1.04	6.12	63.80	.24	1.43	14.90	.0319	.0695	.459	.940	.0321	.6	1.059	.221	.080	9
10	1.38	6.95	47.29	.34	1.73	11.79	.0264	.0695	.380	.948	.0270	2.1	1.045	.238	.080	10
11	2.08	12.61	34.90	.64	3.87	10.66	.0192	.0695	.277	.960	.0200	4.2	1.035	.247	.080	11
12	6.27	33.04	33.32	13.84	72.92	73.53	.0124	.0695	.178	.974	.0123	-.7	1.026	2.152	.080	12
13	26.79	69.90	29.58	******	******	*****	.0065	.0695	.094	.985	.0066	.9	1.009	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.439	GRAM/KW-HR	(.327	GRAM/BHP-HR)
BSCO ------- =	3.707	GRAM/KW-HR	(2.766	GRAM/BHP-HR)
BSNOX ------ =	14.388	GRAM/KW-HR	(10.734	GRAM/BHP-HR)
BSHC + BSNOX =	14.827	GRAM/KW-HR	(11.061	GRAM/BHP-HR)
CORR. BSFC - =	.241	KG/KW-HR	(.397	LBS/BHP-HR)

TABLE D-18A. ENGINE D22 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: CUMMINS NH-250 NO. 2 FUEL BAROMETER 29.44
TEST D22-1 FUEL: EM-465-F PROJECT:11-5044-001 DATE: 01/22/81

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 610.	0.	.0	.030	4.23	4.6	.888	224.	183.	1.07	160.	37.	60.	77.	1
2	2	INTER / 1500.	18.	2.8	.082	10.72	4.6	.889	328.	306.	1.38	140.	113.	211.	140.	2
3	25	INTER / 1500.	218.	34.3	.154	10.59	4.6	.896	140.	239.	3.30	365.	91.	137.	306.	3
4	50	INTER / 1500.	437.	68.6	.263	10.51	4.6	.907	114.	264.	5.65	715.	84.	150.	598.	4
5	75	INTER / 1500.	655.	102.9	.380	10.24	4.6	.920	108.	391.	8.43	1230.	81.	214.	1012.	5
6	100	INTER / 1500.	873.	137.2	.580	9.72	4.6	.945	16.	3915.	13.49	1680.	4.	1998.	1323.	6
7		IDLE / 610.	0.	.0	.027	4.16	4.6	.888	212.	226.	1.14	155.	30.	64.	64.	7
8	100	RATED / 2100.	760.	167.0	.719	13.54	4.4	.937	16.	3018.	12.05	1215.	6.	2146.	1320.	8
9	75	RATED / 2100.	570.	125.3	.509	13.83	4.4	.916	80.	586.	8.48	960.	31.	426.	1043.	9
10	50	RATED / 2100.	380.	83.5	.358	14.61	4.4	.901	109.	359.	5.80	575.	40.	269.	633.	10
11	25	RATED / 2100.	190.	41.8	.227	14.74	4.4	.890	140.	172.	3.40	315.	54.	283.	368.	11
12	2	RATED / 2100.	15.	3.3	.129	14.57	4.4	.892	368.	412.	1.97	160.	142.	318.	178.	12
13		IDLE / 610.	0.	.0	.028	4.15	4.4	.880	216.	239.	1.22	170.	29.	65.	67.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	"PHI"	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	20.37	33.54	42.50	******	******	*****	.0071	.0695	.103	.990	.0053	-26.3	.993	*****	.067	1
2	23.02	43.15	29.68	40.31	76.30	50.64	.0077	.0695	.110	.987	.0068	-10.9	1.017	1.739	.080	2
3	4.32	14.58	32.45	1.18	3.99	8.91	.0148	.0695	.214	.971	.0154	5.3	1.016	.269	.080	3
4	2.14	9.52	37.87	.49	2.19	8.69	.0251	.0695	.361	.952	.0264	5.1	1.016	.226	.080	4
5	1.37	9.39	44.33	.30	2.08	9.83	.0372	.0695	.536	.931	.0389	4.4	1.018	.218	.080	5
6	.13	57.41	38.01	.03	14.56	9.64	.0599	.0695	.862	.892	.0624	4.1	1.020	.244	.080	6
7	18.10	39.86	38.41	******	******	*****	.0066	.0695	.095	.989	.0056	-15.5	.992	*****	.067	7
8	.14	49.74	30.60	.04	12.85	7.90	.0533	.0695	.767	.903	.0558	4.7	1.051	.246	.080	8
9	1.01	13.46	34.17	.25	3.40	8.32	.0369	.0695	.532	.930	.0392	6.0	1.058	.230	.080	9
BUST 10	1.87	12.50	29.43	.48	3.22	7.57	.0246	.0695	.354	.951	.0271	10.0	1.057	.244	.080	10
BUST 11	3.96	20.74	35.50	1.29	4.77	8.32	.0155	.0695	.223	.968	.0171	10.3	1.056	.309	.080	11
12	18.30	40.44	22.88	43.25	96.77	54.10	.0089	.0695	.128	.982	.0097	8.3	1.056	2.237	.080	12
13	17.27	38.44	39.26	******	******	*****	.0069	.0695	.099	.989	.0060	-12.9	.993	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ------- =	.751	GRAM/KW-HR	(.560 GRAM/BHP-HR)
BSCO ------- =	8.230	GRAM/KW-HR	(6.139 GRAM/BHP-HR)
BSNOX ------ =	9.222	GRAM/KW-HR	(6.879 GRAM/BHP-HR)
BSHC + BSNOX =	9.973	GRAM/KW-HR	(7.440 GRAM/BHP-HR)
CORR. BSFC - =	.262	KG/KW-HR	(.431 LBS/BHP-HR)

TABLE D-18B. ENGINE D22 THIRTEEN-MODE EMISSIONS RESULTS

13-MODE FEDERAL DIESEL EMISSION CYCLE 1979

ENGINE: CUMMINS NH-250 NO. 2 FUEL BAROMETER 29.49
TEST D22-2 FUEL: EM-6465-F PROJECT:11-5044-001 DATE: 01/27/81

MODE	POWER PCT	ENGINE SPEED COND / RPM	TORQUE OBS N X M	POWER OBS KW	FUEL FLOW KG/MIN	AIR FLOW KG/MIN	INTAKE HUMID G/KG	NOX CORR FACT	MEASURED HC PPM	MEASURED CO PPM	MEASURED CO2 PCT	MEASURED NOX PPM	CALCULATED GRAMS / HOUR HC	CALCULATED GRAMS / HOUR CO	CALCULATED GRAMS / HOUR NOX	MODE
1		IDLE / 610.	0.	.0	.029	4.08	7.7	.936	160.	186.	1.45	185.	19.	99.	66.	1
2	2	INTER / 1500.	18.	2.8	.076	10.61	7.7	.936	276.	284.	1.52	192.	81.	167.	128.	2
3	25	INTER / 1500.	217.	34.1	.159	10.43	7.7	.941	116.	199.	3.54	340.	32.	108.	324.	3
4	50	INTER / 1500.	433.	68.0	.256	10.15	7.7	.944	108.	206.	5.88	740.	30.	109.	606.	4
5	75	INTER / 1500.	650.	102.1	.383	9.88	7.7	.954	106.	372.	8.88	1350.	29.	195.	1106.	5
6	100	INTER / 1500.	865.	135.9	.577	9.55	7.7	.975	12.	3678.	14.04	1695.	3.	1800.	1320.	6
7		IDLE / 610.	0.	.0	.026	4.05	7.7	.935	160.	173.	1.54	215.	16.	34.	64.	7
8	100	RATED / 2100.	759.	165.8	.737	13.14	7.7	.972	8.	2760.	12.43	1185.	3.	1457.	1332.	8
9	75	RATED / 2100.	566.	124.9	.496	13.38	7.7	.958	64.	528.	8.48	960.	24.	379.	1063.	9
10	50	RATED / 2100.	377.	82.9	.361	13.78	7.7	.950	80.	305.	5.80	550.	31.	231.	699.	10
11	25	RATED / 2100.	189.	41.6	.292	13.98	7.7	.943	124.	332.	3.54	300.	52.	273.	380.	11
12	2	RATED / 2100.	16.	3.6	.118	14.14	7.7	.937	360.	399.	1.87	150.	133.	299.	169.	12
13		IDLE / 610.	0.	.0	.026	3.68	8.2	.992	160.	212.	1.44	210.	17.	95.	68.	13

MODE	CALCULATED GRAMS/KG-FUEL HC	CO	NOX	CALCULATED GRAMS/KW-HR HC	CO	NOX	F/A DRY MEAS	F/A STOICH	"PHI"	WET HC CORR FACT	F/A CALC	F/A PCT MEAS	POWER CORR FACT	BSFC CORR KG/KW-HR	MODAL WEIGHT FACTOR	MODE
1	10.93	25.50	38.73	******	******	*****	.0071	.0695	.101	.986	.0070	-.6	1.014	*****	.067	1
2	19.78	34.68	28.00	29.28	60.36	46.08	.0073	.0695	.105	.985	.0074	2.2	1.044	1.576	.080	2
3	3.35	11.34	34.15	.94	3.18	9.57	.0154	.0695	.221	.968	.0167	8.7	1.045	.268	.080	3
4	1.92	7.09	39.46	.44	1.60	8.92	.0254	.0695	.366	.950	.0274	7.7	1.043	.217	.080	4
5	1.28	8.48	48.16	.29	1.91	10.84	.0390	.0695	.562	.927	.0408	4.6	1.043	.216	.080	5
6	.09	61.97	38.12	.02	13.24	8.71	.0609	.0695	.876	.888	.0646	6.1	1.045	.244	.080	6
7	10.02	21.69	41.15	******	******	*****	.0064	.0695	.092	.984	.0077	19.2	1.024	*****	.067	7
8	.07	44.22	30.12	.02	11.80	8.03	.0565	.0695	.814	.900	.0573	1.4	1.079	.247	.080	8
9	.81	12.59	35.76	.19	3.01	8.55	.0373	.0695	.537	.929	.0391	4.9	1.084	.220	.080	9
10	1.44	10.64	29.72	.38	2.78	7.77	.0264	.0695	.380	.950	.0271	2.9	1.085	.241	.080	10
11	3.57	18.85	26.21	1.25	6.59	9.16	.0174	.0695	.251	.968	.0168	-3.7	1.084	.322	.080	11
12	18.84	41.73	23.48	37.14	82.27	47.27	.0084	.0695	.121	.982	.0092	9.4	1.083	1.820	.080	12
13	10.63	28.26	43.01	******	******	*****	.0072	.0695	.104	.985	.0072	.1	1.018	*****	.067	13

CYCLE COMPOSITE USING 13-MODE WEIGHT FACTORS

BSHC ******* =	.606	GRAM/KW-HR	(.452 GRAM/BHP-HR)
BSCO ******* =	7.372	GRAM/KW-HR	(5.500 GRAM/BHP-HR)
BSNOX ******* =	9.515	GRAM/KW-HR	(7.098 GRAM/BHP-HR)
BSHC + BSNOX =	10.121	GRAM/KW-HR	(7.550 GRAM/BHP-HR)
CORR. BSFC =	.257	KG/KW-HR	(.423 LBS/BHP-HR)

APPENDIX E

COMPUTER PRINTOUTS OF OTHER TESTS

Caterpillar Cycle Comparisons

Table Number	Description
E-1	Caterpillar Cycles, 1979 Cummins NTCC-350
E-2	EPA Hot Starts, 1979 DDA 8V-71N
E-3	Caterpillar Hot Starts, 1979 DDA 8V-71N

Bus Cycles

E-4	Bus Cycles, 1979 DDA 8V-71N

TABLE E-1A. TEST D4-13 EMISSIONS RESULTS

C TRANSIENT

PROJECT NO. 11-8044-001

TEST NO.D4-13 RUN
DATE 7/19/79
TIME 09:15
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 11.1 GM/KG(77.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0140

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)
BLOWER INLET P MM. H2O(IN. H2O)	528.3 (20.8)	528.3 (20.8)	528.3 (20.8)	528.3 (20.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6265	6370	6223
TIME SECONDS	296.0	300.0	305.0	298.0
TOTAL FLOW STD. CU. METRES(SCF)	275.8 (9742)	279.5 (9873)	284.2 (10038)	277.6 (9807)
HC SAMPLE METER/RANGE/PPM	9.5/22/ 38	8.6/22/ 43	9.3/22/ 46	7.1/22/ 35
HC BCKGRD METER/RANGE/PPM	12.0/ 1/ 12	12.0/ 1/ 12	12.0/ 1/ 12	13.0/ 1/ 13
CO SAMPLE METER/RANGE/PPM	50.0/13/ 47	42.3/13/ 39	48.4/13/ 45	35.3/13/ 32
CO BCKGRD METER/RANGE/PPM	5.1/13/ 4	2.2/13/ 2	1.3/13/ 1	2.3/13/ 2
CO2 SAMPLE METER/RANGE/PCT	26.2/ 3/ .91	35.1/ 3/ .59	72.6/ 3/ 1.32	23.0/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.9/ 3/ .04	3.0/ 3/ .05	3.7/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	22.3/ 2/ 22	37.7/ 2/ 38	38.5/ 3/ 115	23.9/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	1.5/ 2/ 2	1.2/ 2/ 1	.3/ 3/ 1	1.3/ 2/ 1
DILUTION FACTOR	31.95	22.50	10.10	35.30
HC CONCENTRATION PPM	26	31	35	23
CO CONCENTRATION PPM	42	36	43	30
CO2 CONCENTRATION PCT	.37	.55	1.28	.32
NOX CONCENTRATION PPM	20.8	36.6	114.7	22.6
HC MASS GRAMS	9.15	6.08	5.81	3.63
CO MASS GRAMS	13.90	11.82	14.08	9.56
CO2 MASS GRAMS	1866.9	2790.7	6640.8	1616.0
NOX MASS GRAMS	11.15	14.82	63.23	12.19
FUEL KG (LB)	.595 (1.31)	.884 (1.95)	2.089 (4.61)	.514 (1.13)
KW HR (HP HR)	1.70 (2.28)	3.12 (4.18)	9.01 (12.08)	1.84 (2.47)
BSHC G/KW HR (G/HP HR)	2.44 (1.82)	1.63 (1.21)	.65 (.48)	1.97 (1.47)
BSCO G/KW HR (G/HP HR)	7.88 (5.88)	3.79 (2.83)	1.56 (1.17)	5.20 (3.87)
BSCO2 G/KW HR (G/HP HR)	1097.96 (818.75)	894.38 (666.94)	737.04 (549.61)	878.00 (654.72)
BSNOX G/KW HR (G/HP HR)	6.56 (4.89)	6.35 (4.74)	7.02 (5.23)	6.62 (4.94)
BSFC KG/KW HR (LB/HP HR)	.350 (.575)	.283 (.466)	.232 (.381)	.279 (.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.928 (32.78)
MULTIPLIER FOR	G/TEST	1.204
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0768 (.0573)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2444 (.1338)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.26 (0.8)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		15.67 (21.02)
BSHC	G/KW HR (G/HP HR)	1.19 (.89)
BSCO	G/KW HR (G/HP HR)	3.12 (2.33)
BSCO2	G/KW HR (G/HP HR)	824 (615)
BSNOX	G/KW HR (G/HP HR)	6.79 (5.06)
BSFC	KG/KW HR (LB/HP HR)	.260 (.428)

TABLE E-1A (CONT'D). TEST D4-13 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-8044-001

ENGINE NO.C 350
ENGINE MODEL 79 Cum 350 NTCC
ENGINE 5.7 L(350 CID) I-6
CVS NO. 10

TEST NO.D4-13 RUN
DATE 7/19/79
TIME
DYNO NO. 5

DIESEL EM-381-F
BAG CART NO. 1

BAROMETER 739.90 MM HG(29.13 IN HG)
DRY BULB TEMP. 26.7 DEG C(80.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 12.5 GM/KG(87.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0618

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)	647.7 (25.5)
BLOWER INLET P MM. H2O(IN. H2O)	528.3 (20.8)	528.3 (20.8)	528.3 (20.8)	528.3 (20.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6183	6264	6371	6222
TIME SECONDS	296.0	300.0	305.0	298.0
TOTAL FLOW STD. CU. METRES(SCF)	295.9 (9794)	279.5 (9871)	284.3 (10040)	277.6 (9805)
HC SAMPLE METER/RANGE/PPM	6.7/22/ 33	9.1/22/ 45	9.7/22/ 49	7.9/22/ 40
HC BCKGRD METER/RANGE/PPM	16.0/ 1/ 16	20.3/ 1/ 20	19.8/ 1/ 20	19.3/ 1/ 19
CO SAMPLE METER/RANGE/PPM	56.6/13/ 59	53.9/13/ 51	55.3/13/ 53	41.9/13/ 39
CO BCKGRD METER/RANGE/PPM	9.7/13/ 8	15.1/13/ 13	14.6/13/ 13	11.2/13/ 10
CO2 SAMPLE METER/RANGE/PCT	23.9/ 3/ .39	34.8/ 3/ .58	73.0/ 3/ 1.33	23.2/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	3.7/ 3/ .06	3.3/ 3/ .05	3.6/ 3/ .06	3.8/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	23.2/ 2/ 23	40.7/ 2/ 41	40.5/ 3/ 121	24.3/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	.8/ 2/ 1	.9/ 3/ 1	1.2/ 2/ 1
DILUTION FACTOR	33.74	22.65	10.03	34.88
HC CONCENTRATION PPM	18	26	31	21
CO CONCENTRATION PPM	45	37	39	28
CO2 CONCENTRATION PCT	.33	.53	1.28	.32
NOX CONCENTRATION PPM	22.3	39.9	120.9	23.1
HC MASS GRAMS	2.83	4.18	5.05	3.34
CO MASS GRAMS	14.34	12.12	12.92	9.20
CO2 MASS GRAMS	1684.6	2932.0	6641.9	1625.8
NOX MASS GRAMS	12.51	22.66	69.51	13.04
FUEL KG (LB)	.535 (1.18)	.862 (1.90)	2.081 (4.59)	.515 (1.13)
KW HR (HP HR)	1.79 (2.40)	3.30 (4.42)	8.99 (12.06)	1.89 (2.54)
BSHC G/KW HR (G/HP HR)	1.58 (1.18)	1.27 (.95)	.56 (.42)	1.77 (1.32)
BSCO G/KW HR (G/HP HR)	8.02 (5.98)	3.68 (2.74)	1.44 (1.07)	4.86 (3.63)
BSCO2 G/KW HR (G/HP HR)	942.19 (702.59)	829.01 (618.19)	738.84 (550.73)	858.76 (640.38)
BSNOX G/KW HR (G/HP HR)	7.00 (5.22)	6.88 (5.13)	7.73 (5.76)	6.89 (5.14)
BSFC KG/KW HR (LB/HP HR)	.299 (.492)	.261 (.430)	.231 (.380)	.272 (.447)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.47	(21.42)
BSHC G/KW HR (G/HP HR)	.96	(.72)
BSCO G/KW HR (G/HP HR)	3.04	(2.27)
BSCO2 G/KW HR (G/HP HR)	794	(592)
BSNOX G/KW HR (G/HP HR)	7.37	(5.50)
BSFC KG/KW HR (LB/HP HR)	.250	(.411)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.961	(33.93)
MULTIPLIER FOR	G/TEST	1.163	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0728	(.0543)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2913	(.1321)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.26	(0.0)

TABLE E-1B. TEST D4-14 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C 350
ENGINE MODEL 79 CUM 350 NTCC
ENGINE 5.7 L(350 CID) I-6
CVS NO. 10

TEST NO.D4-14 RUN
DATE 7/20/79
TIME 09:55
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 743.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 56 PCT
ABSOLUTE HUMIDITY 11.3 GM/KG(79.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0208

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	657.9 (25.9)	657.9 (25.9)	657.9 (25.9)	657.9 (25.9)
BLOWER INLET P MM. H2O(IN. H2O)	530.9 (20.9)	530.9 (20.9)	530.9 (20.9)	530.9 (20.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180	6264	6371	6222
TIME SECONDS	296.0	300.0	305.0	298.0
TOTAL FLOW STD. CU. METRES(SCF)	276.9 (9779)	280.6 (9912)	285.9 (10081)	278.7 (9845)
HC SAMPLE METER/RANGE/PPM	5.9/22/ 27	6.0/22/ 30	8.2/22/ 41	6.9/22/ 32
HC BCKGRD METER/RANGE/PPM	12.6/ 1/ 13	12.8/ 1/ 13	13.0/ 1/ 13	12.9/ 1/ 13
CO SAMPLE METER/RANGE/PPM	99.8/13/ 92	90.3/13/ 37	99.1/13/ 96	35.3/13/ 32
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1	.9/13/ 1	1.0/13/ 1	.9/13/ 1
CO2 SAMPLE METER/RANGF/PCT	25.6/ 3/ .92	35.3/ 3/ .59	79.5/ 3/ 1.36	22.6/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .09	2.8/ 3/ .09	3.0/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	21.3/ 2/ 21	38.1/ 2/ 38	39.2/ 3/ 118	23.9/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.6/ 2/ 1	.1/ 3/ 0	.5/ 2/ 1
DILUTION FACTOR	31.59	22.92	9.82	35.98
HC CONCENTRATION PPM	15	18	29	20
CO CONCENTRATION PPM	90	35	93	31
CO2 CONCENTRATION PCT	.38	.55	1.31	.32
NOX CONCENTRATION PPM	20.7	37.5	117.3	22.9
HC MASS GRAMS	2.90	2.88	9.80	3.15
CO MASS GRAMS	12.85	11.56	14.42	9.97
CO2 MASS GRAMS	1909.9	2828.1	6873.6	1625.5
NOX MASS GRAMS	11.20	20.57	65.40	12.97
FUEL KG (LB)	.606 (1.34)	.893 (1.97)	2.161 (4.76)	.516 (1.14)
KW HR (HP HR)	1.65 (2.21)	3.14 (4.21)	9.05 (12.13)	1.89 (2.54)
BSHC G/KW HR (G/HP HR)	1.46 (1.09)	.92 (.68)	.53 (.40)	1.66 (1.24)
BSCO G/KW HR (G/HP HR)	7.80 (5.81)	3.69 (2.75)	1.59 (1.19)	5.27 (3.93)
BSCO2 G/KW HR (G/HP HR)	1158.81 (864.12)	901.30 (672.10)	759.92 (566.67)	858.63 (640.28)
BSNOX G/KW HR (G/HP HR)	6.80 (5.07)	6.55 (4.89)	7.23 (5.39)	6.59 (4.91)
BSFC KG/KW HR (LB/HP HR)	.368 (.604)	.285 (.468)	.239 (.393)	.273 (.448)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	15.72 (21.09)
BSHC G/KW HR (G/HP HR)	.84 (.63)
BSCO G/KW HR (G/HP HR)	3.10 (2.31)
BSCO2 G/KW HR (G/HP HR)	842 (628)
BSNOX G/KW HR (G/HP HR)	6.92 (5.20)
BSFC KG/KW HR (LB/HP HR)	.266 (.437)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.922 (32.57)
MULTIPLIER FOR	G/TEST	1.216
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0774 (.0577)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2912 (.1321)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	78.17 (0.0)

TABLE E-1B (CONT'D). TEST D14-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C 350
ENGINE MODEL 79 CUM 350 NTCC
ENGINE 5.7 L(350 CID) I-6
CVS NO. 10

TEST NO.D4-14 RUN
DATE 7/20/79
TIME 10:53
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 743.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 54 PCT
ABSOLUTE HUMIDITY 11.0 GM/KG(76.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0090

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	655.3 (25.8)	655.3 (25.8)	655.3 (25.8)	655.3 (25.8)
BLOWER INLET P MM. H2O(IN. H2O)	530.9 (20.9)	530.9 (20.9)	530.9 (20.9)	530.9 (20.9)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6180	6264	6370	6362
TIME SECONDS	296.0	300.0	305.0	304.8
TOTAL FLOW STD. CU. METRES(SCF)	276.9 (9780)	280.7 (9913)	285.9 (10081)	285.1 (10068)
HC SAMPLE METER/RANGE/PPM	5.7/22/ 29	7.6/22/ 38	8.9/22/ 42	6.9/22/ 32
HC BCKGRD METER/RANGE/PPM	12.4/ 1/ 12	12.3/ 1/ 12	11.2/ 1/ 11	10.5/ 1/ 10
CO SAMPLE METER/RANGE/PPM	46.1/13/ 43	43.0/13/ 40	45.5/13/ 42	34.4/13/ 31
CO BCKGRD METER/RANGE/PPM	.7/13/ 1	.8/13/ 1	.9/13/ 1	1.0/13/ 1
CO2 SAMPLE METER/RANGE/PCT	24.4/ 3/ .40	34.8/ 3/ .58	71.8/ 3/ 1.30	23.6/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	3.0/ 3/ .05	3.2/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	22.6/ 2/ 23	39.7/ 2/ 40	37.9/ 3/ 114	24.1/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.3/ 2/ 0	.2/ 3/ 1	1.0/ 2/ 1
DILUTION FACTOR	33.15	22.72	10.24	34.55
HC CONCENTRATION PPM	17	26	32	22
CO CONCENTRATION PPM	41	38	40	30
CO2 CONCENTRATION PCT	.36	.54	1.26	.33
NOX CONCENTRATION PPM	22.5	39.4	113.2	23.1
HC MASS GRAMS	2.66	4.27	5.25	3.57
CO MASS GRAMS	13.36	12.46	13.29	9.89
CO2 MASS GRAMS	1803.5	2766.4	6569.0	1735.8
NOX MASS GRAMS	12.03	21.35	62.34	12.73
FUEL KG (LB)	.573 (1.26)	.876 (1.93)	2.066 (4.55)	.551 (1.22)
KW HR (HP HR)	1.82 (2.44)	3.30 (4.42)	9.05 (12.13)	2.02 (2.70)
BSHC G/KW HR (G/HP HR)	1.46 (1.09)	1.30 (.97)	.58 (.43)	1.77 (1.32)
BSCO G/KW HR (G/HP HR)	7.33 (5.46)	3.78 (2.82)	1.47 (1.10)	4.90 (3.66)
BSCO2 G/KW HR (G/HP HR)	989.28 (737.71)	839.45 (625.98)	726.24 (541.56)	861.07 (642.10)
BSNOX G/KW HR (G/HP HR)	6.60 (4.92)	6.48 (4.83)	6.89 (5.14)	6.31 (4.71)
BSFC KG/KW HR (LB/HP HR)	.314 (.517)	.266 (.437)	.228 (.395)	.273 (.450)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	16.18 (	21.70)
BSHC G/KW HR (G/HP HR)	.97 (	.73)
BSCO G/KW HR (G/HP HR)	3.03 (	2.26)
BSCO2 G/KW HR (G/HP HR)	796 (	593)
BSNOX G/KW HR (G/HP HR)	6.70 (	5.00)
BSFC KG/KW HR (LB/HP HR)	.251 (	.413)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.998 (	35.24)
MULTIPLIER FOR	G/TEST	1.131	
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0699 (	.0521)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2781 (	.1262)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	78.26 (	0.0)

TABLE E-2A. TEST D5-9 EMISSIONS RESULTS

HOT TRANSIENT 3

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 1n

TEST NO. D5-9 RUN 3
DATE 8/21/79
TIME 0?:51
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 741.17 MM HG(29.18 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 9.? GM/KG(68.0 GRAINS/LB)

NOX HUMIDITY C.F. .9680

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)
BLOWER INLET P MM. H2O(IN. H2O)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6263	6372	6235
TIME SECONDS	296.1	299.8	305.0	298.5
TOTAL FLOW STD. CU. METRES(SCF)	277.4 (9799)	281.1 (9928)	286.0 (10101)	279.8 (9883)
HC SAMPLE METER/RANGE/PPM	42.0/11/ 42	40.9/11/ 41	60.9/11/ 61	25.1/11/ 25
HC BCKGRD METER/RANGE/PPM	8.0/ 1/ 8	9.3/ 1/ 9	7.0/ 1/ 7	6.2/ 1/ 6
CO SAMPLE METER/RANGE/PPM	33.7/13/ 31	50.9/13/ 48	56.5/12/ 122	20.6/13/ 18
CO BCKGRD METER/RANGE/PPM	1.3/13/ 1	.9/13/ 1	.9/12/ 1	.9/13/ 1
CO2 SAMPLE METER/RANGE/PCT	19.0/ 9/ .30	27.7/ 3/ .45	66.9/ 3/ 1.20	19.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.2/ 3/ .05	3.9/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	23.2/ 2/ 23	31.6/ 2/ 32	81.1/ 2/ 81	24.0/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1	1.2/ 2/ 1	1.9/ 2/ 1	1.7/ 2/ 2
DILUTION FACTOR	42.96	28.90	10.99	43.13
HC CONCENTRATION PPM	34	32	54	19
CO CONCENTRATION PPM	29	46	117	17
CO2 CONCENTRATION PCT	.26	.41	1.15	.26
NOX CONCENTRATION PPM	22.2	30.4	79.8	22.3
HC MASS GRAMS	5.47	5.17	8.99	3.07
CO MASS GRAMS	9.34	14.92	38.89	5.59
CO2 MASS GRAMS	1305.0	2098.1	6043.3	1317.1
NOX MASS GRAMS	11.42	15.84	42.27	11.58
FUEL KG (LB)	.418 (.92)	.669 (1.47)	1.918 (4.23)	.418 (.92)
KW HR (HP HR)	1.42 (1.90)	2.14 (2.94)	7.20 (9.66)	1.38 (1.86)
BSHC G/KW HR (G/HP HR)	3.85 (2.87)	2.36 (1.76)	1.25 (.93)	2.22 (1.66)
BSCO G/KW HR (G/HP HR)	6.58 (4.91)	6.81 (5.08)	5.40 (4.02)	4.04 (3.01)
BSCO2 G/KW HR (G/HP HR)	919.07 (685.35)	957.51 (714.02)	838.82 (625.51)	951.09 (709.22)
BSNOX G/KW HR (G/HP HR)	8.04 (6.00)	7.23 (5.39)	5.87 (4.38)	8.36 (6.23)
BSFC KG/KW HR (LB/HP HR)	.294 (.484)	.305 (.502)	.266 (.438)	.302 (.496)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.20 (16.36)
BSHC G/KW HR (G/HP HR)	1.86 (1.39)
BSCO G/KW HR (G/HP HR)	5.63 (4.20)
BSCO2 G/KW HR (G/HP HR)	882 (658)
BSNOX G/KW HR (G/HP HR)	6.65 (4.96)
BSFC KG/KW HR (LB/HP HR)	.281 (.461)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	1.099 (38.65)
MULTIPLIER FOR	G/TEST	1.027
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0842 (.0628)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.3002 (.1362)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-2A (CONT'D). TEST D5-9 EMISSIONS RESULTS

HOT TRANSIENT 5 — PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO. D5-9 RUN 5
DATE 8/21/79
TIME
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.5 GRAINS/LB) NOX HUMIDITY C.F. .9795

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)
BLOWER INLET P MM. H2O(IN. H2O)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6263	6371	6224
TIME SECONDS	296.0	299.8	305.0	298.0
TOTAL FLOW STD. CU. METRES(SCF)	277.5 (9800)	281.2 (9930)	286.0 (10102)	279.4 (9868)
HC SAMPLE METER/RANGE/PPM	44.6/11/ 45	42.4/11/ 42	61.9/11/ 62	26.9/11/ 27
HC BCKGRD METER/RANGE/PPM	6.0/ 1/ 6	6.5/ 1/ 7	5.0/ 1/ 5	4.5/ 1/ 5
CO SAMPLE METER/RANGE/PPM	33.2/13/ 30	51.1/13/ 48	53.9/12/ 116	19.9/13/ 18
CO BCKGRD METER/RANGE/PPM	.2/13/ 0	.1/13/ 0	.1/12/ 0	.9/13/ 1
CO2 SAMPLE METER/RANGE/PCT	14.4/ 3/ .31	28.4/ 3/ .47	68.1/ 3/ 1.23	14.3/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.3/ 3/ .05	3.3/ 3/ .05	3.7/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	24.7/ 2/ 25	32.8/ 2/ 33	89.7/ 2/ 90	26.1/ 2/ 26
NOX BCKGRD METER/RANGE/PPM	2.1/ 2/ 2	1.7/ 2/ 2	1.8/ 2/ 2	2.5/ 2/ 3
DILUTION FACTOR	42.02	28.14	10.78	42.66
HC CONCENTRATION PPM	39	36	57	23
CO CONCENTRATION PPM	29	47	111	17
CO2 CONCENTRATION PCT	.26	.42	1.18	.25
NOX CONCENTRATION PPM	22.6	31.2	88.1	23.7
HC MASS GRAMS	6.19	5.85	9.47	3.63
CO MASS GRAMS	9.48	15.36	36.88	5.37
CO2 MASS GRAMS	1339.6	2154.8	6179.0	1301.5
NOX MASS GRAMS	11.78	16.42	47.19	12.39
FUEL KG (LB)	.430 (.95)	.687 (1.52)	1.960 (4.32)	.413 (.91)
KW HR (HP HR)	1.42 (1.90)	2.16 (2.89)	7.20 (9.66)	1.38 (1.86)
BSHC G/KW HR (G/HP HR)	4.36 (3.25)	2.71 (2.02)	1.31 (.98)	2.62 (1.95)
BSCO G/KW HR (G/HP HR)	6.68 (4.98)	7.12 (5.31)	5.12 (3.82)	3.88 (2.89)
BSCO2 G/KW HR (G/HP HR)	943.47 (703.54)	999.40 (745.26)	857.65 (639.55)	939.84 (700.84)
BSNOX G/KW HR (G/HP HR)	8.29 (6.18)	7.61 (5.68)	6.55 (4.88)	8.94 (6.67)
BSFC KG/KW HR (LB/HP HR)	.303 (.498)	.319 (.524)	.272 (.447)	.298 (.491)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.17	(16.31)
BSHC G/KW HR (G/HP HR)	2.07	(1.54)
BSCO G/KW HR (G/HP HR)	5.51	(4.11)
BSCO2 G/KW HR (G/HP HR)	902	(673)
BSNOX G/KW HR (G/HP HR)	7.21	(5.38)
BSFC KG/KW HR (LB/HP HR)	.287	(.472)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.099 (38.65)
MULTIPLIER FOR	G/TEST	1.027
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0844 (.0630)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2943 (.1335)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-2B. TEST D5-10 EMISSIONS RESULTS

HOT TRANSIENT 1

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-10 RUN 1
DATE 8/23/79
TIME 01:20
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.1 GRAINS/LB)

NOX HUMIDITY C.F. .9732

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)
BLOWER INLET P MM. H2O(IN. H2O)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6265	6371	6202
TIME SECONDS	296.0	299.9	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	276.6 (9771)	280.4 (9904)	285.2 (10072)	277.6 (9804)
HC SAMPLE METER/RANGE/PPM	36.5/11/ 37	41.1/11/ 41	59.8/11/ 60	28.9/11/ 29
HC BCKGRD METER/RANGE/PPM	7.0/ 1/ 7	7.0/ 1/ 7	6.5/ 1/ 7	6.8/ 1/ 7
CO SAMPLE METER/RANGE/PPM	31.0/13/ 28	54.9/13/ 52	58.9/12/ 129	22.5/13/ 20
CO BCKGRD METER/RANGE/PPM	1.1/13/ 1	1.2/13/ 1	.6/12/ 1	.7/13/ 1
CO2 SAMPLE METER/RANGE/PCT	14.7/ 3/ .32	28.2/ 3/ .46	66.9/ 3/ 1.20	18.9/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .06	3.0/ 3/ .05	3.1/ 3/ .05	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	25.0/ 2/ 25	33.2/ 2/ 33	86.2/ 2/ 86	24.6/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	1.5/ 2/ 2	1.0/ 2/ 1	.9/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	41.49	28.33	10.99	43.53
HC CONCENTRATION PPM	30	34	54	22
CO CONCENTRATION PPM	27	50	123	14
CO2 CONCENTRATION PCT	.26	.42	1.16	.25
NOX CONCENTRATION PPM	23.5	32.2	85.4	23.7
HC MASS GRAMS	4.74	5.56	8.87	3.56
CO MASS GRAMS	8.55	16.31	40.68	6.16
CO2 MASS GRAMS	1330.8	2153.9	6048.1	1281.6
NOX MASS GRAMS	12.12	16.83	45.32	12.26
FUEL KG (LB)	.425 (.94)	.687 (1.51)	1.920 (4.23)	.407 (.90)
KW HR (HP HR)	1.42 (1.90)	2.21 (2.96)	7.19 (9.64)	1.38 (1.86)
BSHC G/KW HR (G/HP HR)	3.34 (2.49)	2.52 (1.88)	1.23 (.92)	2.57 (1.92)
BSCO G/KW HR (G/HP HR)	6.02 (4.49)	7.39 (5.51)	5.66 (4.22)	4.45 (3.31)
BSCO2 G/KW HR (G/HP HR)	937.30 (698.94)	975.18 (727.19)	841.52 (627.52)	925.49 (690.14)
BSNOX G/KW HR (G/HP HR)	8.54 (6.37)	7.62 (5.68)	6.31 (4.70)	8.85 (6.60)
BSFC KG/KW HR (LB/HP HR)	.299 (.492)	.311 (.511)	.267 (.439)	.294 (.484)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		12.20 (16.36)
BSHC	G/KW HR (G/HP HR)	1.86 (1.39)
BSCO	G/KW HR (G/HP HR)	5.88 (4.38)
BSCO2	G/KW HR (G/HP HR)	886 (661)
BSNOX	G/KW HR (G/HP HR)	7.09 (5.29)
BSFC	KG/KW HR (LB/HP HR)	.282 (.463)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.086 (38.37)
MULTIPLIER FOR	G/TEST	1.031
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0845 (.0630)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2997 (.1359)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-2B (CONT'D). TEST D5-10 EMISSIONS RESULTS

HOT TRANSIENT 3

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-10 RUN 3
DATE 8/22/79
TIME 0214O
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.1 GRAINS/LB)

NOX HUMIDITY C.F. .9732

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	632.5 (24.9)	632.5 (24.9)	632.5 (24.9)	632.5 (24.9)
BLOWER INLET P MM. H2O(IN. H2O)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)	502.9 (19.8)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6261	6372	6203
TIME SECONDS	296.0	299.8	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	276.6 (9769)	280.1 (9894)	285.1 (10070)	277.5 (9802)
HC SAMPLE METER/RANGE/PPM	41.9/11/ 42	42.4/11/ 42	62.1/11/ 62	27.7/11/ 28
HC BCKGRD METER/RANGE/PPM	10.5/ 1/ 10	8.0/ 1/ 8	6.9/ 1/ 7	6.4/ 1/ 6
CO SAMPLE METER/RANGE/PPM	33.4/13/ 30	54.0/13/ 51	56.4/12/ 122	23.0/13/ 21
CO BCKGRD METER/RANGE/PPM	1.9/13/ 2	1.6/13/ 1	.6/12/ 1	1.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	19.0/ 3/ .30	28.1/ 3/ .46	66.8/ 3/ 1.20	19.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.0/ 3/ .05	3.5/ 3/ .05	3.6/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	24.9/ 2/ 25	33.5/ 2/ 33	84.8/ 2/ 85	24.7/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	1.6/ 2/ 2	1.3/ 2/ 1	1.3/ 2/ 1	1.3/ 2/ 1
DILUTION FACTOR	42.97	28.44	11.01	43.06
HC CONCENTRATION PPM	32	35	56	21
CO CONCENTRATION PPM	28	49	116	19
CO2 CONCENTRATION PCT	.26	.42	1.15	.25
NOX CONCENTRATION PPM	23.3	32.2	83.6	23.4
HC MASS GRAMS	5.05	5.60	9.18	3.44
CO MASS GRAMS	9.06	15.88	38.59	6.06
CO2 MASS GRAMS	1316.3	2142.6	6006.9	1283.3
NOX MASS GRAMS	12.02	16.82	44.38	12.11
FUEL KG (LB)	.421 (.93)	.683 (1.51)	1.907 (4.20)	.408 (.90)
KW HR (HP HR)	1.40 (1.88)	2.14 (2.94)	7.22 (9.69)	1.38 (1.86)
BSHC G/KW HR (G/HP HR)	3.60 (2.68)	2.55 (1.91)	1.27 (.95)	2.48 (1.85)
BSCO G/KW HR (G/HP HR)	6.46 (4.82)	7.25 (5.41)	5.34 (3.98)	4.37 (3.26)
BSCO2 G/KW HR (G/HP HR)	938.63 (699.94)	977.84 (729.17)	831.74 (620.23)	926.66 (691.01)
BSNOX G/KW HR (G/HP HR)	8.57 (6.39)	7.67 (5.72)	6.14 (4.58)	8.74 (6.52)
BSFC KG/KW HR (LB/HP HR)	.300 (.494)	.312 (.513)	.264 (.434)	.294 (.484)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.20 (16.36)
BSHC G/KW HR (G/HP HR)	1.91 (1.42)
BSCO G/KW HR (G/HP HR)	5.70 (4.25)
BSCO2 G/KW HR (G/HP HR)	881 (657)
BSNOX G/KW HR (G/HP HR)	6.99 (5.21)
BSFC KG/KW HR (LB/HP HR)	.280 (.461)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.116 (39.43)
MULTIPLIER FOR	G/TEST	1.003
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0822 (.0613)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2932 (.1330)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-3A. TEST D5-9 EMISSIONS RESULTS

HOT TRANSIENT 4

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL =0 DETROIT 8V71N
ENGINE 0.0 L(=0 CID) V-8
CVS NO. 10

TEST NO. D5-9 RUN 4
DATE 8/21/79
TIME 03:31
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 741.17 MM HG(29.18 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.0 GM/KG(70.3 GRAINS/LB)

NOX HUMIDITY C.F. .9784

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)	629.9 (24.8)
BLOWER INLET P MM. H2O(IN. H2O)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)	500.4 (19.7)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6263	6372	6229
TIME SECONDS	296.0	299.8	305.0	298.0
TOTAL FLOW STD. CU. METRES(SCF)	277.4 (9799)	281.1 (9929)	286.0 (10100)	279.3 (9866)
HC SAMPLE METER/RANGE/PPM	32.1/11/ 32	39.6/11/ 40	62.0/11/ 62	26.0/11/ 26
HC BCKGRD METER/RANGE/PPM	6.9/ 1/ 7	7.2/ 1/ 7	5.4/ 1/ 5	5.9/ 1/ 6
CO SAMPLE METER/RANGE/PPM	24.8/13/ 22	49.1/13/ 46	54.8/12/ 118	18.4/13/ 16
CO BCKGRD METER/RANGE/PPM	.1/13/ 0	.1/13/ 0	.1/12/ 0	.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	14.0/ 3/ .30	30.8/ 3/ .51	70.4/ 3/ 1.27	14.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	2.9/ 3/ .04	3.7/ 3/ .06	3.6/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	83.8/ 2/ 84	35.5/ 2/ 35	85.9/ 2/ 86	24.5/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	1.5/ 2/ 2	1.7/ 2/ 2	1.8/ 2/ 2	2.1/ 2/ 2
DILUTION FACTOR	43.21	25.85	10.39	43.15
HC CONCENTRATION PPM	25	33	57	20
CO CONCENTRATION PPM	22	45	113	15
CO2 CONCENTRATION PCT	.25	.47	1.22	.25
NOX CONCENTRATION PPM	22.3	33.9	84.3	22.4
HC MASS GRAMS	4.06	5.29	9.43	3.26
CO MASS GRAMS	6.99	14.68	37.60	5.02
CO2 MASS GRAMS	1281.9	2405.3	6394.7	1291.5
NOX MASS GRAMS	11.60	17.82	45.11	11.74
FUEL KG (LB)	.408 (.90)	.765 (1.69)	2.028 (4.47)	.410 (.90)
KW HR (HP HR)	1.38 (1.86)	2.52 (3.39)	7.43 (9.97)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	2.93 (2.19)	2.10 (1.56)	1.27 (.95)	2.38 (1.78)
BSCO G/KW HR (G/HP HR)	5.05 (3.76)	5.82 (4.34)	5.06 (3.77)	3.67 (2.74)
BSCO2 G/KW HR (G/HP HR)	925.67 (690.27)	952.88 (710.57)	860.37 (641.58)	944.57 (704.37)
BSNOX G/KW HR (G/HP HR)	8.37 (6.25)	7.06 (5.26)	6.07 (4.53)	8.58 (6.40)
BSFC KG/KW HR (LB/HP HR)	.295 (.485)	.303 (.498)	.273 (.448)	.300 (.492)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.71 (17.04)
BSHC G/KW HR (G/HP HR)	1.93 (1.29)
BSCO G/KW HR (G/HP HR)	5.06 (3.77)
BSCO2 G/KW HR (G/HP HR)	895 (667)
BSNOX G/KW HR (G/HP HR)	6.79 (5.06)
BSFC KG/KW HR (LB/HP HR)	.284 (.467)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	1.184 (41.81)
MULTIPLIER FOR	G/TEST	.949
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0747 (.0557)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2629 (.1193)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-3A (CONT'D). TEST D5-9 EMISSIONS RESULTS

HOT TRANSIENT 6

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO. D5-9 RUN 6
DATE 8/21/79
TIME
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.0 GM/KG(70.3 GRAINS/LB)

NOX HUMIDITY C.F. .9783

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	624.8 (24.6)	624.8 (24.6)	624.8 (24.6)	624.8 (24.6)
BLOWER INLET P MM. H2O(IN. H2O)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6262	6371	6203
TIME SECONDS	296.0	299.8	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	277.6 (9807)	281.2 (9934)	286.1 (10106)	278.6 (9840)
HC SAMPLE METER/RANGE/PPM	27.0/11/ 27	37.5/11/ 37	58.6/11/ 59	24.8/11/ 25
HC BCKGRD METER/RANGE/PPM	6.0/ 1/ 6	6.0/ 1/ 6	5.4/ 1/ 5	5.8/ 1/ 6
CO SAMPLE METER/RANGE/PPM	22.3/13/ 20	48.7/13/ 46	55.4/12/ 120	17.5/13/ 15
CO BCKGRD METER/RANGE/PPM	.3/13/ 0	.7/13/ 1	.2/12/ 0	.5/13/ 0
CO2 SAMPLE METER/RANGE/PCT	19.2/ 3/ .31	31.3/ 3/ .82	71.3/ 3/ 1.29	18.7/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .06	3.5/ 3/ .05	3.1/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	26.8/ 2/ 26	39.1/ 2/ 39	96.7/ 2/ 97	27.1/ 2/ 27
NOX BCKGRD METER/RANGE/PPM	2.4/ 2/ 2	2.7/ 2/ 3	2.7/ 2/ 3	3.1/ 2/ 3
DILUTION FACTOR	42.85	25.42	10.24	44.13
HC CONCENTRATION PPM	21	32	54	14
CO CONCENTRATION PPM	19	44	114	15
CO2 CONCENTRATION PCT	.25	.47	1.25	.25
NOX CONCENTRATION PPM	23.5	36.5	94.3	24.1
HC MASS GRAMS	3.39	5.14	8.87	3.08
CO MASS GRAMS	6.20	14.40	38.04	4.78
CO2 MASS GRAMS	1292.4	2407.1	6539.1	1284.4
NOX MASS GRAMS	12.19	19.21	50.48	12.55
FUEL KG (LB)	.411 (.91)	.765 (1.69)	2.072 (4.57)	.407 (.90)
KW HR (HP HR)	1.38 (1.86)	2.52 (3.39)	7.41 (9.94)	1.37 (1.83)
BSHC G/KW HR (G/HP HR)	2.45 (1.83)	2.04 (1.52)	1.20 (.89)	2.25 (1.68)
BSCO G/KW HR (G/HP HR)	4.48 (3.34)	5.70 (4.25)	5.13 (3.83)	3.49 (2.60)
BSCO2 G/KW HR (G/HP HR)	933.28 (695.95)	953.60 (711.10)	881.88 (657.62)	939.39 (700.50)
BSNOX G/KW HR (G/HP HR)	8.80 (6.56)	7.61 (5.68)	6.81 (5.08)	9.18 (6.84)
BSFC KG/KW HR (LB/HP HR)	.297 (.487)	.303 (.498)	.279 (.459)	.298 (.489)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	18.69 (	17.02)
BSHC G/KW HR (G/HP HR)	1.61 (	1.20)
BSCO G/KW HR (G/HP HR)	5.00 (	3.73)
BSCO2 G/KW HR (G/HP HR)	908 (	677)
BSNOX G/KW HR (G/HP HR)	7.44 (	5.55)
BSFC KG/KW HR (LB/HP HR)	.288 (	.473)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.093 (38.62)
MULTIPLIER FOR	G/TEST	1.028
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0810 (.0604)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2811 (.1275)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-3B. TEST D5-10 EMISSIONS RESULTS

HOT TRANSIENT 2 — PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-10 RUN 2
DATE 8/22/79
TIME 02:00 — DIESEL EM-321-F
DYNO NO. 5 — BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.5 GRAINS/LB) — NOX HUMIDITY C.F. .9792

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)
BLOWER INLET P MM. H2O(IN. H2O)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6181	6262	6371	6203
TIME SECONDS	296.0	299.8	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	296.8 (9775)	280.4 (9903)	285.3 (10076)	277.7 (9810)
HC SAMPLE METER/RANGE/PPM	43.4/11/ 43	45.4/11/ 45	64.7/11/ 65	28.3/11/ 28
HC BCKGRD METER/RANGE/PPM	9.0/ 1/ 9	8.8/ 1/ 9	34.8/ 1/ 35	9.2/ 1/ 9
CO SAMPLE METER/RANGE/PPM	32.1/13/ 29	53.9/13/ 51	58.9/12/ 129	19.0/13/ 17
CO BCKGRD METER/RANGE/PPM	1.0/13/ 1	1.0/13/ 1	.8/12/ 1	1.6/13/ 1
CO2 SAMPLE METER/RANGE/PCT	19.3/ 3/ .31	30.8/ 3/ .51	69.6/ 3/ 1.26	18.2/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	3.6/ 3/ .06	3.4/ 3/ .05	3.3/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	24.0/ 2/ 24	37.3/ 2/ 37	89.2/ 2/ 89	83.5/ 2/ 83
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	1.1/ 2/ 1	1.8/ 2/ 2	1.4/ 2/ 1
DILUTION FACTOR	42.28	25.80	10.51	45.32
HC CONCENTRATION PPM	35	37	33	19
CO CONCENTRATION PPM	28	49	122	16
CO2 CONCENTRATION PCT	.26	.46	1.21	.24
NOX CONCENTRATION PPM	23.1	36.2	87.8	22.1
HC MASS GRAMS	5.53	5.98	5.47	3.09
CO MASS GRAMS	8.91	16.01	40.53	4.90
CO2 MASS GRAMS	1296.9	2361.3	6323.0	1229.8
NOX MASS GRAMS	11.99	19.04	46.94	11.51
FUEL KG (LB)	.415 (.92)	.752 (1.66)	2.003 (4.42)	.390 (.86)
KW HR (HP HR)	1.40 (1.88)	2.51 (3.36)	7.43 (9.97)	1.40 (1.88)
BSHC G/KW HR (G/HP HR)	3.94 (2.94)	2.39 (1.78)	.74 (.55)	2.20 (1.64)
BSCO G/KW HR (G/HP HR)	6.36 (4.74)	6.39 (4.76)	5.45 (4.07)	3.49 (2.60)
BSCO2 G/KW HR (G/HP HR)	924.84 (689.65)	942.01 (702.46)	850.73 (634.39)	876.99 (653.97)
BSNOX G/KW HR (G/HP HR)	8.55 (6.37)	7.59 (5.66)	6.32 (4.71)	8.21 (6.12)
BSFC KG/KW HR (LB/HP HR)	.296 (.487)	.300 (.493)	.269 (.443)	.278 (.457)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.94	(17.09)
BSHC G/KW HR (G/HP HR)	1.97	(1.17)
BSCO G/KW HR (G/HP HR)	5.52	(4.12)
BSCO2 G/KW HR (G/HP HR)	880	(656)
BSNOX G/KW HR (G/HP HR)	7.02	(5.24)
BSFC KG/KW HR (LB/HP HR)	.279	(.459)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.128 (39.85)
MULTIPLIER FOR	G/TEST	.993
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0779 (.0581)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2789 (.1265)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-3B (CONT'D). TEST D5-10 EMISSIONS RESULTS

HOT TRANSIENT 4

PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-10 RUN 4
DATE 8/23/79
TIME 03:25
DYNO NO. 5

DIESEL EM-321-F
BAG CART NO. 1

BAROMETER 739.39 MM HG(29.11 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.1 GRAINS/LB)

NOX HUMIDITY C.F. .9732

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)	627.4 (24.7)
BLOWER INLET P MM. H20(IN. H20)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)	497.8 (19.6)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	6182	6263	6373	6203
TIME SECONDS	296.1	299.8	305.0	297.0
TOTAL FLOW STD. CU. METRES(SCF)	276.8 (9777)	280.4 (9905)	285.4 (10079)	277.7 (9810)
HC SAMPLE METER/RANGE/PPM	32.5/11/ 32	41.2/11/ 41	62.9/11/ 63	26.1/11/ 26
HC BCKGRD METER/RANGE/PPM	6.5/ 1/ 7	6.9/ 1/ 7	6.0/ 1/ 6	6.1/ 1/ 6
CO SAMPLE METER/RANGE/PPM	29.4/13/ 27	52.3/13/ 50	57.2/12/ 124	20.3/13/ 18
CO BCKGRD METER/RANGE/PPM	1.3/13/ 1	1.7/13/ 1	.8/12/ 1	1.2/13/ 1
CO2 SAMPLE METER/RANGE/PCT	19.5/ 3/ .31	31.2/ 3/ .52	69.9/ 3/ 1.26	18.5/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.7/ 3/ .06	3.8/ 3/ .06	3.5/ 3/ .05	3.5/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	24.7/ 2/ 25	37.2/ 2/ 37	90.4/ 2/ 90	24.6/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	1.3/ 2/ 1	1.3/ 2/ 1	1.3/ 2/ 1	1.4/ 2/ 1
DILUTION FACTOR	42.01	25.47	10.47	44.67
HC CONCENTRATION PPM	26	35	58	20
CO CONCENTRATION PPM	25	47	118	17
CO2 CONCENTRATION PCT	.26	.46	1.21	.24
NOX CONCENTRATION PPM	23.4	36.0	89.2	23.2
HC MASS GRAMS	4.17	5.59	9.47	3.23
CO MASS GRAMS	8.02	15.29	39.13	5.38
CO2 MASS GRAMS	1306.7	2368.0	6342.5	1240.2
NOX MASS GRAMS	12.07	18.77	47.40	12.01
FUEL KG (LB)	.417 (.92)	.754 (1.66)	2.012 (4.44)	.394 (.87)
KW HR (HP HR)	1.37 (1.83)	2.51 (3.36)	7.43 (9.97)	1.40 (1.88)
BSHC G/KW HR (G/HP HR)	3.05 (2.28)	2.23 (1.66)	1.27 (.95)	2.30 (1.72)
BSCO G/KW HR (G/HP HR)	5.86 (4.37)	6.10 (4.55)	5.26 (3.93)	3.84 (2.86)
BSCO2 G/KW HR (G/HP HR)	955.66 (712.63)	944.68 (704.45)	853.35 (636.34)	884.39 (659.49)
BSNOX G/KW HR (G/HP HR)	8.83 (6.58)	7.49 (5.58)	6.38 (4.76)	8.57 (6.39)
BSFC KG/KW HR (LB/HP HR)	.305 (.501)	.301 (.494)	.271 (.445)	.281 (.462)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	12.71 (17.04)
BSHC G/KW HR (G/HP HR)	1.97 (1.32)
BSCO G/KW HR (G/HP HR)	5.34 (3.98)
BSCO2 G/KW HR (G/HP HR)	886 (661)
BSNOX G/KW HR (G/HP HR)	7.10 (5.30)
BSFC KG/KW HR (LB/HP HR)	.281 (.463)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	1.119 (39.52)
MULTIPLIER FOR	G/TEST	1.001
MULTIPLIER FOR	G/KW HR (G/HP HR)	.0788 (.0587)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.2800 (.1270)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	80.42 (0.0)

TABLE E-4A. TEST D5-12 EMISSIONS RESULTS

BUS CYCLE NO.1

PROJECT NO. 11-5044-001

TEST NO.D5-12 RUN
DATE 8/24/79
TIME 01:40
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.5 GRAINS/LB)

NOX HUMIDITY C.F. .9793

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

BAG RESULTS

	1	2	3
BAG NUMBER			
BLOWER DIF P MM. H2O(IN. H2O)	650.2 (25.6)	650.2 (25.6)	650.2 (25.6)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	5696	6012	5694
TIME SECONDS	272.8	287.9	272.7
TOTAL FLOW STD. CU. METRES(SCF)	272.8 (9637)	288.0 (10172)	272.8 (9634)
HC SAMPLE METER/RANGE/PPM	30.1/11/ 30	31.5/11/ 31	31.5/11/ 31
HC BCKGRD METER/RANGE/PPM	7.8/ 1/ 8	7.7/ 1/ 8	7.9/ 1/ 8
CO SAMPLE METER/RANGE/PPM	24.4/13/ 22	57.3/13/ 55	25.0/13/ 22
CO BCKGRD METER/RANGE/PPM	3.2/13/ 3	3.7/13/ 3	4.2/13/ 4
CO2 SAMPLE METER/RANGE/PCT	20.9/ 3/ .34	25.5/ 3/ .42	20.9/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.4/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	25.6/ 2/ 26	33.1/ 2/ 33	25.0/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.7/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	39.17	31.54	40.15
HC CONCENTRATION PPM	23	24	24
CO CONCENTRATION PPM	19	50	18
CO2 CONCENTRATION PCT	.29	.37	.28
NOX CONCENTRATION PPM	24.8	32.4	29.3
HC MASS GRAMS	3.55	3.99	3.74
CO MASS GRAMS	5.93	16.90	5.84
CO2 MASS GRAMS	1437.6	1929.6	1394.4
NOX MASS GRAMS	12.69	17.49	12.43
FUEL KG (LB)	.460 (1.01)	.621 (1.37)	.446 (.98)
KW HR (HP HR)	1.49 (2.00)	2.30 (3.08)	1.47 (1.97)
BSHC G/KW HR (G/HP HR)	2.38 (1.78)	1.74 (1.29)	2.54 (1.89)
BSCO G/KW HR (G/HP HR)	3.98 (2.97)	7.36 (5.49)	3.96 (2.96)
BSCO2 G/KW HR (G/HP HR)	964.81 (719.46)	840.29 (626.60)	946.95 (706.14)
BSNOX G/KW HR (G/HP HR)	8.51 (6.35)	7.62 (5.68)	8.44 (6.29)
BSFC KG/KW HR (LB/HP HR)	.309 (.507)	.270 (.444)	.303 (.498)

TOTAL TEST RESULTS 3 BAGS

TOTAL KW HR (HP HR)	5.26 (	7.05)
BSHC G/KW HR (G/HP HR)	2.14 (	1.60)
BSCO G/KW HR (G/HP HR)	5.45 (	4.07)
BSCO2 G/KW HR (G/HP HR)	905 (	675)
BSNOX G/KW HR (G/HP HR)	8.10 (	6.04)
BSFC KG/KW HR (LB/HP HR)	.290 (	.477)

PARTICULATE DATA, TOTAL FOR 3 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.712 (25.14)
MULTIPLIER FOR	G/TEST	1.171
MULTIPLIER FOR	G/KW HR (G/HP HR)	.2227 (.1661)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.7673 (.3480)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	56.78 (2005.4)

TABLE E-4A (CONT'D). TEST D5-12 EMISSIONS RESULTS

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

BUS CYCLE NO.2

PROJECT NO. 11-5044-001

TEST NO.D5-12 RUN
DATE 8/24/79
TIME
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(70.5 GRAINS/LB)

NOX HUMIDITY C.F. .9793

BAG RESULTS

	1	2	3
BAG NUMBER			
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	5696	6013	5697
TIME SECONDS	272.7	287.9	272.8
TOTAL FLOW STD. CU. METRES(SCF)	272.8 (9636)	288.0 (10173)	272.9 (9638)
HC SAMPLE METER/RANGE/PPM	35.0/11/ 35	32.6/11/ 33	29.5/11/ 29
HC BCKGRD METER/RANGE/PPM	7.9/ 1/ 8	7.9/ 1/ 8	7.1/ 1/ 7
CO SAMPLE METER/RANGE/PPM	26.9/13/ 24	56.2/13/ 54	23.2/13/ 21
CO BCKGRD METER/RANGE/PPM	1.8/13/ 2	1.6/13/ 1	.9/13/ 1
CO2 SAMPLE METER/RANGE/PCT	21.0/ 3/ .34	25.5/ 3/ .42	20.3/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.1/ 3/ .05	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	24.4/ 2/ 24	32.4/ 2/ 32	24.8/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	1.1/ 2/ 1	1.1/ 2/ 1	1.2/ 2/ 1
DILUTION FACTOR	38.90	31.54	40.40
HC CONCENTRATION PPM	27	25	23
CO CONCENTRATION PPM	22	51	19
CO2 CONCENTRATION PCT	.29	.37	.29
NOX CONCENTRATION PPM	23.3	31.3	23.6
HC MASS GRAMS	4.30	4.14	3.55
CO MASS GRAMS	7.03	17.10	6.20
CO2 MASS GRAMS	1453.6	1953.5	1431.6
NOX MASS GRAMS	11.92	16.91	12.08
FUEL KG (LB)	.466 (1.03)	.628 (1.39)	.458 (1.01)
KW HR (HP HR)	1.49 (2.00)	2.33 (3.13)	1.47 (1.97)
BSHC G/KW HR (G/HP HR)	2.88 (2.15)	1.78 (1.32)	2.41 (1.80)
BSCO G/KW HR (G/HP HR)	4.72 (3.52)	7.34 (5.47)	4.21 (3.14)
BSCO2 G/KW HR (G/HP HR)	975.55 (727.47)	837.90 (624.82)	972.26 (725.01)
BSNOX G/KW HR (G/HP HR)	8.00 (5.97)	7.25 (5.41)	8.20 (6.12)
BSFC KG/KW HR (LB/HP HR)	.313 (.514)	.270 (.443)	.311 (.511)

TOTAL TEST RESULTS 3 BAGS

TOTAL KW HR (HP HR)	5.29 (	7.10)
BSHC G/KW HR (G/HP HR)	2.26 (	1.69)
BSCO G/KW HR (G/HP HR)	5.73 (	4.27)
BSCO2 G/KW HR (G/HP HR)	914 (	682)
BSNOX G/KW HR (G/HP HR)	7.73 (	5.76)
BSFC KG/KW HR (LB/HP HR)	.293 (	.482)

PARTICULATE DATA, TOTAL FOR 3 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.764 (26.99)
MULTIPLIER FOR	G/TEST	1.091
MULTIPLIER FOR	G/KW HR (G/HP HR)	.2061 (.1537)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.7028 (.3188)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	56.52 (1996.3)

TABLE E-4A (CONT'D). TEST D5-12 EMISSIONS RESULTS

BUS CYCLE NO.3 — PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-12 RUN
DATE 8/24/79
TIME
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 739.14 MM HG(29.10 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 52 PCT
ABSOLUTE HUMIDITY 9.9 GM/KG(69.2 GRAINS/LB)

NOX HUMIDITY C.F. .9733

BAG RESULTS

	1	2	3
BAG NUMBER			
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	5696	6013	5696
TIME SECONDS	272.8	287.9	272.8
TOTAL FLOW STD. CU. METRES(SCF)	272.9 (9641)	288.1 (10177)	272.9 (9641)
HC SAMPLE METER/RANGE/PPM	32.8/11/ 33	31.8/11/ 32	28.7/11/ 29
HC BCKGRD METER/RANGE/PPM	4.5/ 1/ 5	4.2/ 1/ 4	4.1/ 1/ 4
CO SAMPLE METER/RANGE/PPM	25.0/13/ 22	51.8/13/ 49	21.3/13/ 19
CO BCKGRD METER/RANGE/PPM	.2/13/ 0	.1/13/ 0	.1/13/ 0
CO2 SAMPLE METER/RANGE/PCT	20.5/ 3/ .33	24.4/ 3/ .40	19.4/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.4/ 3/ .04	2.4/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	24.0/ 2/ 24	30.8/ 2/ 31	23.3/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1	1.0/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	39.93	33.08	42.38
HC CONCENTRATION PPM	28	28	25
CO CONCENTRATION PPM	22	48	18
CO2 CONCENTRATION PCT	.29	.35	.27
NOX CONCENTRATION PPM	23.0	29.8	22.4
HC MASS GRAMS	4.47	4.60	3.89
CO MASS GRAMS	6.91	16.02	5.87
CO2 MASS GRAMS	1434.0	1868.8	1390.4
NOX MASS GRAMS	11.70	16.00	11.39
FUEL KG (LB)	.460 (1.01)	.602 (1.33)	.429 (.95)
KW HR (HP HR)	1.49 (2.00)	2.28 (3.06)	1.47 (1.97)
BSHC G/KW HR (G/HP HR)	3.00 (2.24)	2.02 (1.51)	2.69 (1.97)
BSCO G/KW HR (G/HP HR)	4.63 (3.46)	7.03 (5.24)	3.98 (2.97)
BSCO2 G/KW HR (G/HP HR)	962.43 (717.68)	820.05 (611.51)	910.28 (678.80)
BSNOX G/KW HR (G/HP HR)	7.85 (5.86)	7.02 (5.24)	7.74 (5.77)
BSFC KG/KW HR (LB/HP HR)	.309 (.507)	.264 (.434)	.292 (.479)

TOTAL TEST RESULTS 3 BAGS

TOTAL KW HR (HP HR)	5.24 (7.03)
BSHC G/KW HR (G/HP HR)	2.47 (1.84)
BSCO G/KW HR (G/HP HR)	5.49 (4.10)
BSCO2 G/KW HR (G/HP HR)	886 (661)
BSNOX G/KW HR (G/HP HR)	7.46 (5.56)
BSFC KG/KW HR (LB/HP HR)	.284 (.468)

PARTICULATE DATA, TOTAL FOR 3 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.738 (26.07)
MULTIPLIER FOR	G/TEST	1.130
MULTIPLIER FOR	G/KW HR (G/HP HR)	.2156 (.1608)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.7579 (.3438)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	56.90 (2009.9)

TABLE E-4B. TEST D5-13 EMISSIONS RESULTS

BUS CYCLE NO.1 — PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-13 RUN
DATE 8/28/79
TIME 01:45
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 736.85 MM HG(29.01 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 9.8 GM/KG(68.4 GRAINS/LB) NOX HUMIDITY C.F. .9698

BAG RESULTS

	1	2	3
BAG NUMBER			
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	515.6 (20.3)	515.6 (20.3)	515.6 (20.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	5693	6011	5695
TIME SECONDS	272.7	287.9	272.8
TOTAL FLOW STD. CU. METRES(SCF)	271.7 (9593)	286.9 (10133)	271.8 (9600)
HC SAMPLE METER/RANGE/PPM	30.6/11/ 31	32.0/11/ 32	30.2/11/ 30
HC BCKGRD METER/RANGE/PPM	7.0/ 1/ 7	6.9/ 1/ 7	6.5/ 1/ 7
CO SAMPLE METER/RANGE/PPM	28.5/13/ 86	56.7/13/ 84	22.2/13/ 20
CO BCKGRD METER/RANGE/PPM	1.2/13/ 1	1.0/13/ 1	1.0/13/ 1
CO2 SAMPLE METER/RANGE/PCT	20.6/ 3/ .33	25.3/ 3/ .41	20.2/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.7/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	25.7/ 2/ 26	33.6/ 2/ 34	25.2/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.9/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	39.71	31.81	40.61
HC CONCENTRATION PPM	24	25	24
CO CONCENTRATION PPM	24	52	14
CO2 CONCENTRATION PCT	.30	.37	.28
NOX CONCENTRATION PPM	24.9	32.7	24.3
HC MASS GRAMS	3.73	4.18	3.74
CO MASS GRAMS	7.63	17.38	5.86
CO2 MASS GRAMS	1473.4	1958.9	1417.5
NOX MASS GRAMS	12.56	17.42	12.26
FUEL KG (LB)	.472 (1.04)	.630 (1.39)	.453 (1.00)
KW HR (HP HR)	1.53 (2.05)	2.33 (3.13)	1.53 (2.05)
BSHC G/KW HR (G/HP HR)	2.45 (1.82)	1.79 (1.34)	2.45 (1.83)
BSCO G/KW HR (G/HP HR)	5.00 (3.73)	7.45 (5.56)	3.84 (2.86)
BSCO2 G/KW HR (G/HP HR)	966.12 (720.43)	840.20 (626.54)	929.47 (693.11)
BSNOX G/KW HR (G/HP HR)	8.24 (6.14)	7.47 (5.57)	8.04 (6.00)
BSFC KG/KW HR (LB/HP HR)	.309 (.509)	.270 (.444)	.297 (.489)

TOTAL TEST RESULTS 3 BAGS

TOTAL KW HR (HP HR)	5.38 (	7.22)
BSHC G/KW HR (G/HP HR)	2.17 (	1.61)
BSCO G/KW HR (G/HP HR)	5.74 (	4.28)
BSCO2 G/KW HR (G/HP HR)	901 (	672)
BSNOX G/KW HR (G/HP HR)	7.85 (	5.85)
BSFC KG/KW HR (LB/HP HR)	.289 (	.475)

PARTICULATE DATA, TOTAL FOR 3 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	.746 (26.34)
MULTIPLIER FOR	G/TEST	1.114
MULTIPLIER FOR	G/KW HR (G/HP HR)	.2069 (.1543)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.7158 (.3247)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	56.35 (1990.1)

TABLE E-4B (CONT'D). TEST D5-13 EMISSIONS RESULTS

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

BAROMETER 736.85 MM HG(29.01 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

BUS CYCLE NO.2

PROJECT NO. 11-5044-001

TEST NO.D5-13 RUN
DATE 8/28/79
TIME 02:20
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(71.0 GRAINS/LB)

NOX HUMIDITY C.F. .9815

BAG RESULTS	1	2	3
BAG NUMBER	1	2	3
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	5694	6012	5694
TIME SECONDS	272.7	287.9	272.9
TOTAL FLOW STD. CU. METRES(SCF)	271.8 (9600)	287.0 (10136)	271.8 (9600)
HC SAMPLE METER/RANGE/PPM	38.6/11/ 39	35.9/11/ 36	31.7/11/ 32
HC BCKGRD METER/RANGE/PPM	8.6/ 1/ 9	8.5/ 1/ 9	7.9/ 1/ 8
CO SAMPLE METER/RANGE/PPM	24.2/13/ 22	57.6/13/ 55	22.5/13/ 20
CO BCKGRD METER/RANGE/PPM	.8/13/ 1	.5/13/ 0	.4/13/ 0
CO2 SAMPLE METER/RANGE/PCT	20.8/ 3/ .34	26.4/ 3/ .43	20.8/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	2.9/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	24.8/ 2/ 25	33.1/ 2/ 33	25.4/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	1.1/ 2/ 1	1.1/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	39.27	30.39	39.37
HC CONCENTRATION PPM	30	28	24
CO CONCENTRATION PPM	20	53	19
CO2 CONCENTRATION PCT	.29	.39	.29
NOX CONCENTRATION PPM	23.7	32.0	29.3
HC MASS GRAMS	4.74	4.58	3.76
CO MASS GRAMS	6.48	17.82	6.10
CO2 MASS GRAMS	1423.5	2045.1	1461.0
NOX MASS GRAMS	12.11	17.26	12.41
FUEL KG (LB)	.457 (1.01)	.658 (1.45)	.467 (1.03)
KW HR (HP HR)	1.54 (2.07)	2.33 (3.13)	1.53 (2.05)
BSHC G/KW HR (G/HP HR)	3.07 (2.29)	1.97 (1.47)	2.47 (1.84)
BSCO G/KW HR (G/HP HR)	4.20 (3.13)	7.64 (5.70)	4.00 (2.98)
BSCO2 G/KW HR (G/HP HR)	922.79 (688.13)	877.19 (654.12)	957.97 (714.36)
BSNOX G/KW HR (G/HP HR)	7.85 (5.85)	7.40 (5.52)	8.14 (6.07)
BSFC KG/KW HR (LB/HP HR)	.296 (.487)	.282 (.464)	.306 (.504)

PARTICULATE DATA, TOTAL FOR 3 BAGS

90MM FILTER
SAMPLE FLOW SCM(SCF) .785 (27.73)
MULTIPLIER FOR G/TEST 1.058
MULTIPLIER FOR G/KW HR (G/HP HR) .1959 (.1461)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL) .6687 (.3033)

20 X 20 FILTERS
SAMPLE FLOW SCM(SCF) 56.21 (1985.3)

TOTAL TEST RESULTS 3 BAGS

TOTAL KW HR (HP HR)	5.40 (	7.24)
BSHC G/KW HR (G/HP HR)	2.42 (	1.81)
BSCO G/KW HR (G/HP HR)	5.63 (	4.20)
BSCO2 G/KW HR (G/HP HR)	913 (	681)
BSNOX G/KW HR (G/HP HR)	7.74 (	5.77)
BSFC KG/KW HR (LB/HP HR)	.293 (	.482)

TABLE E-4B (CONT'D). TEST D5-13 EMISSIONS RESULTS

BUS CYCLE NO.3 PROJECT NO. 11-5044-001

ENGINE NO.8V71N
ENGINE MODEL -0 DETROIT 8V71N
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 10

TEST NO.D5-13 RUN
DATE 8/28/79
TIME 02:55
DYNO NO. 5

DIESEL EM-400-F
BAG CART NO. 1

BAROMETER 736.60 MM HG(29.00 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 50 PCT
ABSOLUTE HUMIDITY 10.2 GM/KG(71.3 GRAINS/LB) NOX HUMIDITY C.F. .9831

BAG RESULTS

	1	2	3
BAG NUMBER			
BLOWER DIF P MM. H2O(IN. H2O)	645.2 (25.4)	645.2 (25.4)	645.2 (25.4)
BLOWER INLET P MM. H2O(IN. H2O)	513.1 (20.2)	513.1 (20.2)	513.1 (20.2)
BLOWER INLET TEMP. -DEG. C(DEG. F)	48.9 (120.0)	48.9 (120.0)	48.9 (120.0)
BLOWER REVOLUTIONS	5697	6011	5695
TIME SECONDS	272.9	287.9	272.7
TOTAL FLOW STD. CU. METRES(SCF)	271.8 (9600)	286.8 (10129)	271.7 (9597)
HC SAMPLE METER/RANGE/PPM	32.3/11/ 32	33.3/11/ 33	31.1/11/ 31
HC BCKGRD METER/RANGE/PPM	6.5/ 1/ 7	6.4/ 1/ 6	6.4/ 1/ 6
CO SAMPLE METER/RANGE/PPM	24.9/13/ 22	54.4/13/ 52	21.8/13/ 19
CO BCKGRD METER/RANGE/PPM	.4/13/ 0	.6/13/ 1	.7/13/ 1
CO2 SAMPLE METER/RANGE/PCT	20.9/ 3/ .34	25.9/ 3/ .42	20.8/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.2/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	25.7/ 2/ 26	33.5/ 2/ 33	25.2/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	.8/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	39.14	31.04	39.38
HC CONCENTRATION PPM	26	27	25
CO CONCENTRATION PPM	21	50	18
CO2 CONCENTRATION PCT	.29	.38	.29
NOX CONCENTRATION PPM	24.8	32.7	24.4
HC MASS GRAMS	4.08	4.48	3.90
CO MASS GRAMS	6.80	16.70	5.83
CO2 MASS GRAMS	1439.6	1974.1	1438.1
NOX MASS GRAMS	12.69	17.65	12.48
FUEL KG (LB)	.461 (1.02)	.635 (1.40)	.460 (1.01)
KW HR (HP HR)	1.53 (2.05)	2.33 (3.13)	1.53 (2.05)
BSHC G/KW HR (G/HP HR)	2.67 (1.99)	1.92 (1.43)	2.56 (1.91)
BSCO G/KW HR (G/HP HR)	4.46 (3.32)	7.16 (5.34)	3.82 (2.85)
BSCO2 G/KW HR (G/HP HR)	943.96 (703.91)	846.76 (631.43)	942.95 (703.16)
BSNOX G/KW HR (G/HP HR)	8.32 (6.20)	7.57 (5.65)	8.18 (6.10)
BSFC KG/KW HR (LB/HP HR)	.302 (.497)	.272 (.448)	.302 (.496)

TOTAL TEST RESULTS 3 BAGS

TOTAL KW HR (HP HR)	5.38 (	7.22)
BSHC G/KW HR (G/HP HR)	2.31 (	1.73)
BSCO G/KW HR (G/HP HR)	5.45 (	4.06)
BSCO2 G/KW HR (G/HP HR)	902 (	672)
BSNOX G/KW HR (G/HP HR)	7.96 (	5.93)
BSFC KG/KW HR (LB/HP HR)	.289 (	.475)

PARTICULATE DATA, TOTAL FOR 3 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.776 (27.41)
MULTIPLIER FOR	G/TEST	1.070
MULTIPLIER FOR	G/KW HR (G/HP HR)	.1988 (.1483)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.6875 (.3118)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	56.12 (1982.3)

APPENDIX F

REGRESSION ANALYSIS

Table	Description
F-1	Sample Printout-Regression Analysis
F-2	Regression Analysis Computer Program

TABLE F-1. SAMPLE PRINTOUT-REGRESSION ANALYSIS

H-START2

TEST D22-2 1979 CUMMINS NH-250 DIESEL 01-27-81

-.044	6.926	1.772	6.092	.000	4.994	.005	5.033	.042	4.286
3050.	674.	3000.	2100.	625.	232.	588.			

	CALCULATED VALUES		
	SPEED	TORQUE	POWER
SE	35.	8.%	6.%
M	.998	.964	1.008
R2	.9966	.9392	.9633
R	8.	7.7	-.2

M=1176N= 986

ACCEPTANCE CRITERIA-HOT		
SPEED	TORQUE	POWER
100.	13.%	8.%
.97-1.03	.83-1.03	.89-1.03
.97-1.00	.88-1.00	.91-1.00
-50+50	-15+15	-5+5

THIS RUN IS ACCEPTABLE BASED ON DRAFT SUBPART N JAN 1980

TABLE F-2. REGRESSION ANALYSIS COMPUTER PROGRAM

```
PAGE 0001  FTN.  11:06 AM  SAT.,  5  AUG., 1978


0001  FTN,L
0002        PROGRAM TCP
0003  C*****THIS PROGRAM CALCULATES THE PARAMETERS AND ACCEPTABILITY FOR A RUN
0004  C     LATEST PROGRAM REVISION - AUGUST 27, 1979
0005        DIMENSION TC(600),SC(600),TP(600),SR(600),TR(600),IDTEST(71)
0006       1          ,ITT(7)
0007        DATA STX,STY,STX2,STY2,STXY,SSX,SSY,SSX2,SSY2,SSXY,SHX,SHY,SHX2,
0008       1 SHY2,SHXY/15*0./
0009        M=0
0010        N=0
0011        READ(10,13)ITT,ITID
0012  13    FORMAT(7A1,I1)
0013        WRITE(6,60)ITT,ITID
0014  60    FORMAT(1H0,30X,7A1,I1)
0015        READ(10,15)IDTEST
0016  15    FORMAT(71A1)
0017        WRITE(6,16)IDTEST
0018  16    FORMAT(1H0,71A1)
0019        READ(10,7)TCL,SCL,SRL,TRL,TPL,TCH,SCH,SRH,TRH,VOIDA
0020  7     FORMAT(10F8.3)
0021        READ(10,28)VOIDB,VOIDC,VOIDD,VOIDE,TPH
0022  28    FORMAT(5F8.3)
0023        READ(10,27)TCAL,TMAX,SCAL,SMAX,SIDL,HMAX,PTS
0024  27    FORMAT(7F8.0)
0025        WRITE(6,11)TCL,TCH,SCL,SCH,SRL,SRH,TRL,TRH,TPL,TPH
0026  11    FORMAT(1H0,10F8.3)
0027        WRITE(6,41)TCAL,TMAX,SCAL,SMAX,SIDL,HMAX,PTS
0028  41    FORMAT(1H ,7F8.0)
0029        TCF=TMAX/(TCH-TCL)
0030        TRF=TCAL/(TRH-TRL)
0031        SCF=(SMAX-SIDL)/(SCH-SCL)
0032        SRF=SCAL/(SRH-SRL)
0033        TPCUT=(TPH-TPL)*.99+TPL
0034        NPT=PTS
0035        DO 6 J=1,2
0036        READ(9,1)(TC(I),SC(I),SR(I),TR(I),TP(I),I=1,NPT)
0037  1     FORMAT(25X,5F6.0,25X,5F6.0)
0038        DO 8 I=1,NPT
0039        TC(I)=(TC(I)-TCL)*TCF
0040        SC(I)=(SC(I)-SCL)*SCF+SIDL
0041        SR(I)=SR(I)*SRF
0042  8     TR(I)=TR(I)*TRF
0043        DO 6 I=1,NPT
0044        M=M+1
0045        SSX=SSX+SC(I)
0046        SSY=SSY+SR(I)
0047        SSX2=SSX2+SC(I)**2
0048        SSY2=SSY2+SR(I)**2
0049        SSXY=SSXY+SC(I)*SR(I)
0050        IF(ABS(TP(I)).GE.ABS(TPCUT).AND.TR(I).LT.TC(I))GO TO 6
0051        IF(TC(I).LT.(-.11*TMAX))GO TO 6
0052        N=N+1
0053        STX=STX+TC(I)
0054        STY=STY+TR(I)
0055        STX2=STX2+TC(I)**2
```

TABLE F-2 (Cont'd). REGRESSION ANALYSIS COMPUTER PROGRAM

PAGE 0002 TCP 11:06 AM SAT., 5 AUG., 1978

```
0056          STY2=STY2+TR(I)**2
0057          STXY=STXY+TC(I)*TR(I)
0058          SHX=SHX+TC(I)*SC(I)
0059          SHY=SHY+TR(I)*SR(I)
0060          SHX2=SHX2+(TC(I)*SC(I))**2
0061          SHY2=SHY2+(TR(I)*SR(I))**2
0062          SHXY=SHXY+TC(I)*SC(I)*TR(I)*SR(I)
0063   6      CONTINUE
0064          TMN=STXY-STX*STY/N
0065          TMD=STX2-STX**2/N
0066          TM=TMN/TMD
0067          TB=STY/N-TM*STX/N
0068          TR2=TMN**2/(TMD*(STY2-STY**2/N))
0069          TSE=SQRT((STY2-TB*STY-TM*STXY)/N)*100./TMAX
0070          SMN=SSXY-SSX*SSY/M
0071          SMD=SSX2-SSX**2/M
0072          SM=SMN/SMD
0073          SB=SSY/M-SM*SSX/M
0074          SR2=SMN**2/(SMD*(SSY2-SSY**2/M))
0075          SSE=SQRT((SSY2-SB*SSY-SM*SSXY)/M)
0076          HMN=SHXY-SHX*SHY/N
0077          HMD=SHX2-SHX**2/N
0078          HM=HMN/HMD
0079          HB=(SHY/N-HM*SHX/N)/5252.
0080          HR2=HMN**2/(HMD*(SHY2-SHY**2/N))
0081          HSE=SQRT((SHY2-HB*5252.*SHY-HM*SHXY)/N)/(5252.*HMAX*.01)
0082          WRITE(6,18)
0083   18     FORMAT(1H0,5X,"CALCULATED VALUES",14X,"ACCEPTANCE CRITERIA-HOT")
0084          WRITE(6,2)
0085   2      FORMAT(1H ,4X,"SPEED TORQUE  POWER",
0086         1       15X,"SPEED    TORQUE     POWER")
0087          WRITE(6,3)SSE,TSE,HSE
0088   3      FORMAT(1H ,"SE",X,F6.0,X,F5.0,"%",X,F5.0,"%",
0089         1       17X,"100.",5X,"13.%",7X,"8.%")
0090          WRITE(6,4)SM,TM,HM
0091   4      FORMAT(1H ,"M ",X,F6.3,X,F6.3,X,F6.3,
0092         1       13X,".97-1.03",2X,".83-1.03",2X,".89-1.03")
0093          WRITE(6,5)SR2,TR2,HR2
0094   5      FORMAT(1H ,"R2",X,F6.4,X,F6.4,X,F6.4,
0095         1       13X,".97-1.00",2X,".88-1.00",2X,".91-1.00")
0096          WRITE(6,9)SB,TB,HB
0097   9      FORMAT(1H ,"B ",X,F6.0,X,F6.1,X,F6.1,
0098         1       15X,"-50+50",4X,"-15+15",6X,"-5+5")
0099          WRITE(6,10)M,N
0100   10     FORMAT(1H ,"M=",I4,"N=",I4)
0101          SHX=SHX/(5252.*3600.)
0102          SHY=SHY/(5252.*3600.)
0103          WRITE(6,14)SHX,SHY
0104   14     FORMAT(2F7.2)
0105   C*****THE FOLLOWING DETERMINES ACCEPTABILITY OF THE RUN BASED ON
0106   C      THE DRAFT OF SUBPART N RECEIVED DECEMBER 1979
0107   C      TEST EQUAL 1 FOR COLD START AND 2 FOR HOT START
0108          IF(SSE.GT.100.) GO TO 20
0109          IF(TSE.GT.13.) GO TO 20
0110          IF(HSE.GT.8.) GO TO 20
```

TABLE F-2 (Cont'd). REGRESSION ANALYSIS COMPUTER PROGRAM

```
PAGE 0003  TCP   11:06 AM  SAT.,  5  AUG., 1978


0111          IF(SR2.LT.0.970) GO TO 20
0112          IF(HR2.LT.0.910) GO TO 20
0113          IF(ABS(SB).GT.50.) GO TO 20
0114          IF(ABS(TB).GT.15.) GO TO 20
0115          IF(ABS(HB).GT.5.) GO TO 20
0116          IF(SM.LT.0.970) GO TO 20
0117          IF(SM.GT.1.030) GO TO 20
0118          IF(TM.LT.0.830) GO TO 30
0119          IF(TM.GT.1.030) GO TO 30
0120          IF(HM.LT.0.890) GO TO 30
0121          IF(HM.GT.1.030) GO TO 30
0122          IF(TR2.LT..880) GO TO 30
0123          WRITE(6,31)
0124   31     FORMAT(1H ,"THIS RUN IS ACCEPTABLE BASED ON DRAFT SUBPART
0125         1             "1980")
0126          IF(ITID.EQ.0) GO TO 45
0127          IF(ITID.GT.2) GO TO 45
0128          GO TO 50
0129   20     IF(ITID.EQ.1) GO TO 40
0130   30     IF(ITID.EQ.1) GO TO 35
0131          IF(ITID.EQ.0) GO TO 45
0132          IF(ITID.GT.2) GO TO 45
0133          WRITE(6,32)
0134   32     FORMAT(1H ,"THIS HOT START RUN IS UNACCEPTABLE BASED ON ",
0135         1"DRAFT SUBPART N JAN, 1980")
0136          GO TO 50
0137   35     CONTINUE
0138          IF(TM.LT.0.770) GO TO 40
0139          IF(TM.GT.1.030) GO TO 40
0140          IF(HM.LT.0.870) GO TO 40
0141          IF(HM.GT.1.030) GO TO 40
0142          IF(TR2.LT.0.850) GO TO 40
0143          WRITE (6,33)
0144   33     FORMAT(1H ,"THIS COLD START RUN IS ACCEPTABLE BASED ON",
0145         1" DRAFT SUBPART N JAN 1980")
0146          GO TO 50
0147   40     WRITE(6,34)
0148   34     FORMAT(1H ,"THIS COLD START RUN IS UNACCEPTABLE BASED ON",
0149         1" DRAFT SUBPART N JAN, 1980")
0150          GO TO 50
0151   45     WRITE(6,19)
0152   19     FORMAT(1H ,"****DATA CARD OMITTED-TEST WAS NOT IDENTIFIED'
0153         1     "AS TO COLD-OR HOT-START****")
0154   50     CONTINUE
0155          WRITE(6,12)
0156   12     FORMAT(1H1)
0157          STOP
0158          END


FTN4 COMPILER: HP92060-16092 REV. 2026 (800423)
```

APPENDIX G

INITIAL SCOPE OF WORK

Exhibit A Contract No. 68-03-2603

Scope of Work
(8 Pages)

The contractor shall test gasoline and Diesel type heavy duty engines by the transient test procedure outlined below. A tentative list of engines appears as Table A-1. Seven gasoline and ten Diesel engines will be from in-use vehicles. The remaining engines will be in new, or nearly new condition.

A minimum of 25 engines of each type shall be tested. Each engine test will require development of an engine torque curve, a high and low speed idle emission check, and a Cold/Hot Start Transient Emission Test. One replicate of the transient test shall be run. In-use engines shall be tested first in "as-received" condition; a tune-up may be required followed by additional testing.

The detailed Test Procedures, Equipment Specifications and Calibration procedures follow. References have been made to EPA's Motor Vehicle Engine Test Procedure, Title 40 of the Code of Federal Regulations Part 86 (e.g., 40 CFR §86.XXX); and also to proposed 40 CFR Part 86, Subpart D for 1979 heavy duty engines; see 41 Federal Register 21292-21313, 24 May 1976.

I. Test Procedures

0. Overview: Figure 1 is a schematic of the test sequence. It shows the different test sequences for new and in-use engines. The items in these sequences, the equipment to be used and the calibration procedures to be followed are described below.

1. Receipt of engine:

(a) EPA will, for each engine, transmit a written test order to the contractor containing the engine description and necessary specifications.

(b) Engines will be furnished by EPA to the test facility. The contractor shall examine the engines for damage during shipment and will verify that the engine delivered is the same as specified in the test order. EPA will insure that the contractor, at any time, has at least one engine on hand for testing until the total quantity of engines has been tested.

2. Engine adjustment:

(a) All new engines, shall be checked to determine:

(1) Idle speed

(2) Idle CO exhaust concentration

(3) Timing (Gasoline engines only)

(4) Dwell (Gasoline engines only)

These checks shall be made with the engine warmed up.

(b) If the items checked are outside of the specifications on the test order, they shall be adjusted to fall within the specification range

3. Engine mapping

(a) Gasoline engines shall be warmed-up as follows:

(1) Idle - 1 minute

(2) 2000 rpm at 10% torque - 4 minutes

(3) 2000 rpm at 55% torque - 35 minutes

(b) Diesel engines shall be warmed-up by idling for 2 minutes and then by operating at rated speed, maximum power for 10 minutes.

(c) A curve of maximum torque versus speed shall be developed for engine speeds of -22% to +150% (percent speed is defined in the item on engine cycles). Readings will be taken from the lowest to highest speeds in 100 rpm increments. Duplicate readings are then taken going from highest to lowest speeds. The maximum torque curve is derived from the average of the two readings. If an engine will not develop any torque at a required speed, that reading is to be omitted.

4. Pre-test soak:

(a) The engine shall soak at an ambient temperature of 25C $\pm$5 for a period of 8 to 36 hours prior to the cold start test.

(b) If the engine soaks for more than 36 hours, it shall be warmed up, 3(a) or (b), and allowed to soak for 8 to 36 hours prior to the cold start test.

5. Cold start CVS test:

(a) The cold start CVS test is a continuous test consisting of 5 five minute segments in series. Exhaust mass emissions are determined separately for each segment. Engine start-up is included in the initial segment.

(b) All equipment is to be in a stand-by or operating mode prior to the start of the test.

(c) Start the engine, following the manufacturers procedure either using the engine starter or by operating the dynamometer at the engine cranking speed. Exhaust gas sampling is to begin when cranking starts.

(d) Once the engine starts, the operation cycle begins. The engine must be operated over the specified sequence of engine speed and torque, within the tolerances. See Item 11.

(e) At the end of each five minute segment, terminate the previous sampling and begin taking a new sample. Analyze sample bags as soon as possible, but in no case more than 20 minutes after the sample has been collected. Collect and calculate mass emissions in accordance with 40 CFR Part 86, Subpart B.

(f) At the end of the fifth sample collection period, stop sampling and then turn the engine off.

6. Pre-hot start soak: Allow the engine to soak for 15 minutes prior to the hot start test.

7. Hot start test: The hot start test consists of repeating the first segment of the cold start test. Sample collection includes engine starting but does not include engine shut down.

8. Idle test:

(a) Allow the engine to idle following the hot start test.

(b) Measure HC, CO and NOx in the undiluted exhaust with "gararge type" instruments. Also measure undiluted CO_2 using a "laboratory grade" analyzer.

(c) Simultaneously with the undiluted exhaust measurements, collect dilute exhaust and background samples using the CVS. Analyze for HC, CO, CO_2 and NOx.

(d) Increase engine speed to 2500 rpm ($\pm$ 100). If 2500 rpm cannot be obtained, then use maximum obtainable speed. Repeat the procedure in (b) and (c).

(e) Using the ratio of CO_2 undiluted/diluted calculate the undiluted concentrations of HC, CO and NOx from the CVS results.

9. Replication: Repeat items (4) through (8) to obtain a second set of test results. This completes the entire test sequence for new engines.

10. In-use engines; tune-ups:

(a) After running a replicate test on an in-use engine (in "as-received" condition) check the quantities listed in item 2 (a).

(b) If the quantities are within the test order specifications, testing of the in-use engine is complete.

(c) If the quantities are not within the tolerances on the order, proceed to adjust and/or tune-up the engine to meet the test order specifications. After the engine has been adjusted and/or tuned up, proceed with items 3 through 9 as if it were a new engine.

11. Release of engine: Upon completion of testing the contractor shall notify EPA. EPA will arrange to assume custody within a reasonable time.

II. Specifications and Equipment Requirements

12. Test Cycle:

(a) The test cycle is defined in terms of "normalized" speed and power. For speed, 0% indicates idle rpm and 100% is the manufacturers rated rpm for maximum power. For torque, 0% is no torque and 100% is the maximum torque which the engine can produce at a given engine speed. Other values are linearly related to the two set points. Negative values indicate an engine speed below idle or a motoring condition (which will be run with the throttle closed).

(b) The test cycle is defined by a curve through the specified speed and torque sequences.

The tolerances around each curve are defined as follows:

(1) Speed: The upper limit is 25 rpm higher than the highest point on the curve within 1 second of the given time. The lower limit is 25 rpm lower than the lowest point on the curve within 1 second of the given time. On speed accelerations, deviations of speed below the reference speed are acceptable if the engine is operated at WOT until the engine speed agrees with the reference speed.

(2) Torque: The upper limit is 5% or 30 ft-lbs (20 ft-lbs for gasoline engines), whichever is less, greater than the highest point on the curve within 1 second of the given time. The lower limit is 5% or 30 ft-lbs (20 ft-lbs for gasoline engines), whichever is less, lower than the lowest point on the curve within 1 second of the given time. The torque tolerances do not apply for conditions of decreasing torque with simultaneously decreasing speed for engine motoring.

(c) The test cycles will be provided to the contractor within one (1) month after the effective date of the contract.

13. Dynamometer and engine equipment:

(a) The dynamometer shall be capable of performing the test cycle withing the specified tolerances. The engine cooling system shall maintain (approximately) the manufacturers specified operating temperature.

(b) Engine speed and torque shall be continuously recorded to within $\pm$ 1% of the rated speed and maximum torque. In addition, the deviation from the test cycle shall also be shown to verify test validity.

14. Idle check equipment: "Garage type" instruments (Sun, EPA-75; and Teeco, Model 8A; or equivalents) shall be used to obtain idle readings. NDIR (Nondispersive infra-red) detection shall be used for HC and CO, chemiluminescent shall be used for NOx. The "laboratory grade" CO_2 analyzer shall conform to proposed 40 CFR §86.316-79.

15. Fuel: See proposed 40 CFR §86.307.

16. Analytical Gases: See proposed 40 CFR §86.308. Exception, the 0% O_2 oxygen interference check gas is not required.

17. Analyzers: See proposed 40 CFR §§86.316 to 86.318.

18. Exhaust gas sampling system: See 40 CFR §86.109. Flow rates may have to be increased to accommodate the quantities of exhaust gases generated.

19. Exhaust gas analytical system schematic: See 40 CFR §86.111, paragraph (a).

III. Calibrations

20. Calibrations: See proposed 40 CFR §§86.319 and 86.320; 86.326 and 86.327; and 86.330 to 86.333. Also see 40 CFR §86.119.

IV. Data Submission

21. Data submission:

(a) Test results shall be submitted in two manners, packets and punched (and interpreted) 80 column cards. Formats for these submissions shall be specified by the project officer within two months after contract award.

(b) Information to be submitted shall include (as applicable):

Engine Identification
Test Numbers, Dates

Idle RPM (as recieved/adjusted)

Timing (as received/adjusted)

Dwell (as received/adjusted)

Torque curve data

Idle Emissions HC, CO, NOx (as received/adjusted)

Barometric pressure

Ambient temperature

Analyzer calibration curves

CVS Test data, recorded for each segment:

- Inlet air temperature average for wet and dry bulbs
- CVS inlet temperature, PDP only
- CVS flow and raw data
- Background and Sample bag concentrations of HC, CO, CO_2 and NOx including zero and span readings and gas concentrations
- Diesel engine test shall include HFID analyzer data
- Integrated horsepower-hours
- Calculated emissions in grams, grams/mile, grams/hp-hr, grams/lb fuel, grams/kw-hr, grams/km and grams/kg fuel for each segment

(c) Strip charts and test notes shall be retained and submitted as requested by the project officer.

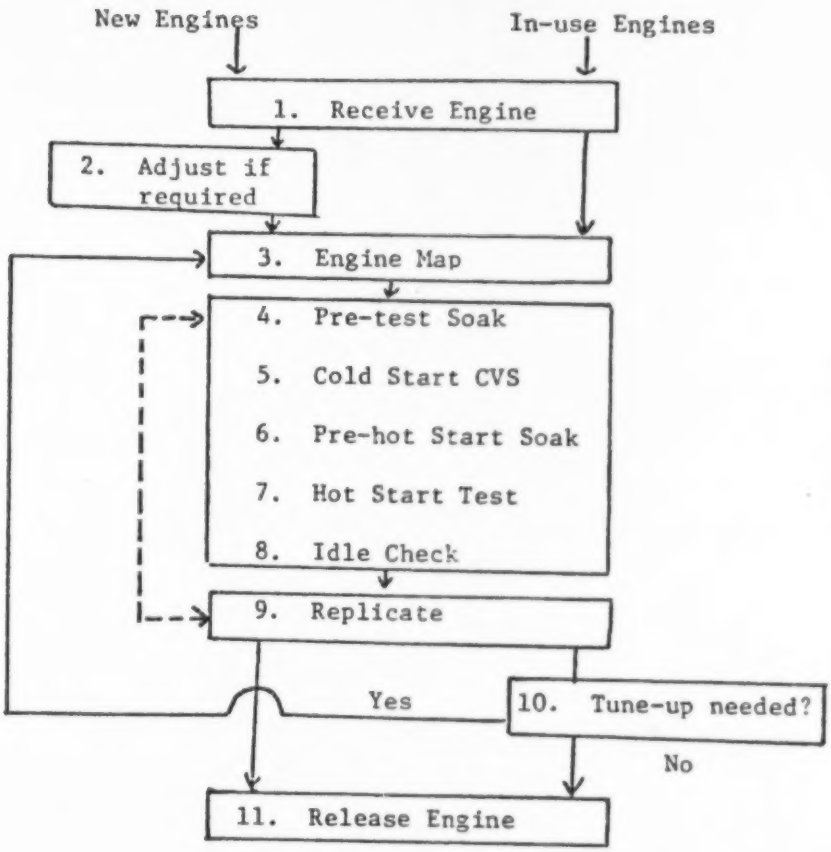
Table A-1

Tentative Engine List

Manufacturer	CID	# New Engines	# In-Use	# Prototypes
Gasoline Engines				
CHRYSLER	318	1 to 2	0 to 1	↑
	360	1 to 2	0 to 1	Undetermined
	440	1 to 2	1	possibly
GENERAL MOTORS	350	1 to 3	1	LDT
	400	1	0 to 1	engines
FORD	300	1	0 to 1	with
	351	1 to 3	1	catalysts
	400	1	0 to 1	will
IHC	196	0 to 1	0 to 1	be
	304	0 to 1	0 to 1	tested
	345	1	0 to 1	↓
	391	0 to 1	0 to 1	
	400	0 to 1	0 to 1	
	446	0 to 1	0 to 1	
TOTAL GASOLINE TO BE TESTED		15	7	3
Diesel Engines				
CUMMINS	855	1 to 3	1 to 2	
	1150	1 to 3	1 to 2	
CATERPILLAR	636	1 to 3	1 to 2	
MACK	672	1 to 3	1 to 2	
GENERAL MOTORS	568	1 to 2	0 to 1	
	552	1 to 2	0 to 1	
	736	1 to 3	1 to 2	
TOTAL DIESEL TO BE TESTED		15	10	

Figure 1

Test Sequence



Fuel in g fuel/kW-hr

TABLE 3. SUMMARY OF BASELINE TEST RESULTS

Engine No.	Manufacturer	Model	Fuel Type	Transient HC	Transient CO	Transient Continuous NO_x	Transient Bagged NO_x	Transient Fuel	Transient Part.
1	Caterpillar	3208[d]	2D	4.53	5.09	--	7.83	269.	1.06
2	Cummins	NTC350[d]	2D	0.91	6.69	--	11.41	281.	0.81
3	DDA	6V92T[d]	2D	1.04	4.22	--	9.55	267.	0.72
4	Cummins	NTCC-350	2D	1.16	3.47	--	6.58	258.	0.52
5	DDA	8V-71N[d]	1D	2.04	5.05	--	7.15	286.	0.92
6	DDA	6V-92TA	1D	1.56	2.00	--	7.80	277.	0.65
7	International	DTI-466B	2D	1.11	1.98	--	7.46	285.	0.48
8	Deutz	F5L-912	Not Tested		--	--	--	--	--
9	Mack	ETAZ	2D	1.07	2.36	9.01	7.04	249.	0.77
10	Mack	ETSX	2D	0.52	2.18	6.90	5.71	281.	0.85
11	Cummins	VTB-903	2D	1.85	1.93	8.10	7.03	278.	0.53
12	Caterpillar	3406DITA	2D	0.81	4.31	11.28	9.93	256.	0.69
13	Caterpillar	3406PCTA	2D	0.64	2.71	7.24	6.86	269.	0.49
14	Cummins	NTC-350-BC	2D	0.83	2.15	9.97	9.14	262.	0.54
15	International	DT-466	2D	1.13	2.78	7.91	7.60	258.	0.71
16	DDA	6V92TA-90mm	2D	1.01	3.80	11.66	10.65	271.	0.73
17	DDA	8V-71TA	2D	0.78	3.20	9.81	9.68	276.	0.51
18	Cummins	NTC-290	2D	1.08	3.24	11.10	10.71	261.	0.78
19[a]	International	DTI-466B	2D	0.89	2.11	7.70	7.64	261.	0.42
20[b]	--	--	--	--	--	--	--	--	--
21	Caterpillar	3406DITA	No baseline tests run			--	--	--	--
22	Cummins	NH-250	2D	2.28	6.77	10.87	9.29	288.	0.97

[a] One test only

[b] Non-baseline engine

[c] Standards:

	CO	$HC+NO_x$
1974-1978	53.6	21.5
1979	33.5	13.4

[d] Designed to pre-1979 standards

Emissions in g/kW-hr, work in kW/hr,
Fuel in g fuel/kW-hr

MARY OF BASELINE TEST RESULTS

Transient					13-Mode [c]			
Continuous NO_x	Bagged NO_x	Fuel	Part.	Work	HC	CO	NO_x	Fuel
--	7.83	269.	1.06	8.99	2.28	4.57	5.40	260.
--	11.41	281.	0.81	15.89	0.32	2.94	12.54	261.
--	9.55	267.	0.72	13.49	0.75	3.41	11.54	263.
--	6.58	258.	0.52	15.45	0.43	4.42	7.72	249.
--	7.15	286.	0.92	12.03	1.13	8.62	9.50	278.
--	7.80	277.	0.65	11.12	1.32	2.32	9.75	264.
--	7.46	285.	0.48	9.08	0.80	1.63	7.63	268.
--	--	--	--	--	--	--	--	--
9.01	7.04	249.	0.77	14.87	0.76	1.74	8.18	238.
6.90	5.71	281.	0.85	15.00	0.47	2.45	5.03	249.
8.10	7.03	278.	0.53	12.21	0.96	2.20	9.29	254.
11.28	9.93	256.	0.69	18.11	0.39	4.06	9.67	227.
7.24	6.86	269.	0.49	17.85	0.23	2.23	6.98	250.
9.97	9.14	262.	0.54	14.99	0.51	3.52	10.35	240.
7.91	7.60	258.	0.71	8.82	0.90	3.31	7.98	262.
11.66	10.65	271.	0.73	14.64	0.91	3.91	11.77	254.
9.81	9.68	276.	0.51	15.43	0.85	4.15	11.04	264.
11.10	10.71	261.	0.78	12.99	0.45	3.61	13.96	242.
7.70	7.64	261.	0.42	9.42	--	--	--	--
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10.87	9.29	288.	0.97	11.32	0.68	7.80	9.37	260.